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https://doi.org/10.15017/26741

出版情報：都市・建築学研究. 20, pp.19-25, 2011-07-15. 九州大学大学院人間環境学研究院都市・建築学部門
バージョン：
権利関係：

都市・建築学研究　九州大学大学院人間環境学研究院紀要　第20号，2011年7月
J. of Architecture and Urban Design, Kyushu University, No. 20, pp. 19 ~ 25, July. 2011

ラサの都市形成と都市的変容に関する研究

Formation and Urban Transformation of Lhasa City

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The Tibetan Buddhism coupled with the religious-based governing system in Tibet, unified the urban form of Lhasa City before urbanization. However, in the last decades, the city has been experiencing significant urban transformation. Hence, this study presents the formation and chronological transformation of Lhasa City with the purpose of understanding the characteristics and mechanisms of transformation in Tibetan cities. First, the study illustrates the original form of Lhasa City by literature review. Subsequently, by investigating the maps and statistics of the city in the last decades, the study identified the physical and socio-economical transformation characteristics of Lhasa City. Accordingly, the most probable factors influencing the transformation of Tibetan cities are clarified.

Keywords: *Urban Structure, Urbanized area, Urban form, Transformation, Lhasa City*
都市構造，市街地，都市形態，変容，ラサ

1. INTRODUCTION

1.1Background

The city form can be seen as the spatial arrangement of persons doing things, the resulting spatial flows of persons, goods, and information, and the physical features which modify space in some way significant to those actions, including enclosures, surfaces, channels, ambiences, and objects (Kevin Lynch). Transformation occurs with the urban development at every level of urban structure. In the last decades, the Chinese cities have been experiencing rapid urbanization and transformation in aspects of physical structure and eco-social system. In Tibet, the cities naturally transforming based on unique natural conditions in plateau, religious culture, and political system, results in specific urban forms in Tibetan cities. After the rezoning of administrative division in Tibet, the change of political and economical system impelled Tibetan cities into urbanization in the last decades. Therefore, the urbanization resulted that the Tibetan cities transformed from several aspects. However, as the harsh natural environment of plateau and comparatively backwardness of economy in Tibet, the development of Tibetan cities fell behind other Chinese cities. Moreover, the Tibetan cities are experiencing in unique way, transformation based on unique natural and cultural background.

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Lhasa City which will be discussed in this study has been the religious, political, and economic center of Tibet after the establishment of religious based governing system. The important status of Lhasa City resulted that it became to the most urbanized city in Tibet. Without doubt, Lhasa City now is experiencing high speed transformation in typical way from several aspects.

However, there is a limited amount of research on the transformation of Tibetan cities until now, because of abominable natural conditions. On the other hand, Socio-economical development and penetration of alien culture in the last decades profoundly transform the Tibetan urban structure have given opportunities and requisition to the researches on Tibetan cities. The previous studies in Tibetan cities didn't focus on the transformation of urban structures in process of urbanization and its impacts on inhabitants' social life.

In this context, this study aims to investigate the transformation process and the related impacts of urban structures in Lhasa City with the purpose of understanding the regulation and motivation of city transformation. Accordingly, the results of this study can be referred in the planning of other Tibetan cities.

1.2 Research Objectives

This study discussing both of the physical and socio-economical transformation of Lhasa City will include the following objectives:

1. Illustrate the formation of original urban form of Lhasa City
2. Identify the physical transforming characteristics of urban structures in Lhasa City by investigating the maps.

3. Clarify the economical and social transformation of Lhasa City.

2. METHODOLOGY

2.1 Investigation Methods

This study which involves the physical and socio-economical transformation under the urbanization process of Lhasa City encompass the following investigation methods: :

1) Literature reviews of books and previous researches on the impact of religious and natural background of Tibet on Tibetan cities.
2) Secondary data collection included books, which contribute to the historic data collection such as historical maps and documents, statistic data and previous researches is the most important method in this study.
3) Physical observation based on questionnaire, sketching, photographing, measuring and mapping in Lhasa City. This investigation mainly involved the physical space and architectural features.

2.2 Outline of Lhasa City

Tibet autonomous region (TAR) located in the southwest of China is an important composition part of Qinghai-Tibet plateau. TAR encompasses 72 counties and one municipality within 7 administrative regions (fig. 1). Lhasa City, the capital of TAR, is located in a small flatland north of Kyichu River with average latitude of 3650m. in the new governing system after 1959, Lhasa City still taking the role of religious economical center of TAR, has been experiencing a rapid transformation (fig. 2).

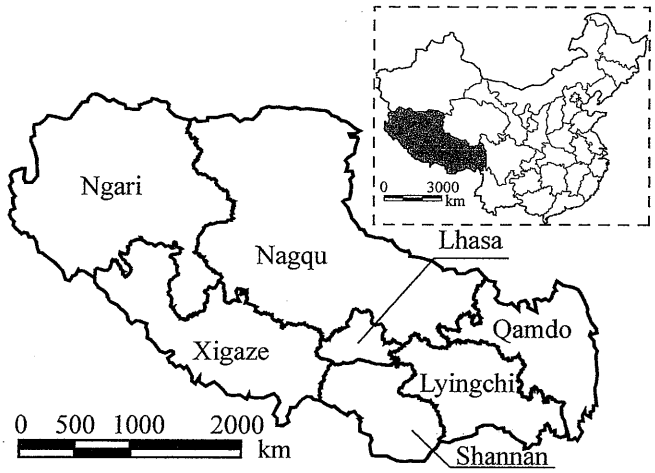


Fig. 1 Location and Administrative Division of Tibet Autonomous Region

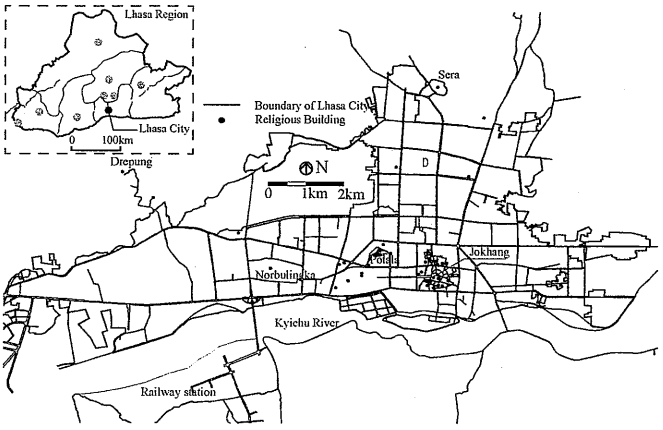


Fig. 2 Location and Graphic Map of Lhasa City

3. ORIGINAL FORM OF LHASA CITY

3.1 Formation of Lhasa City

Lhasa City was constructed as the political and religious center after 633 A.D. when Songtsan established Bod Dynasty [12]. Fig.3 shows the steps of city formation (fig. 3):

Step 1: Potala Palace built on the red mountain resulted in the formation of political center in the city.

Step 2: Ruling class built Jokhang Temple and Ramoche Temple with the purpose of introduce Buddhism. As a result, the two temples became the religious center of Lhasa.

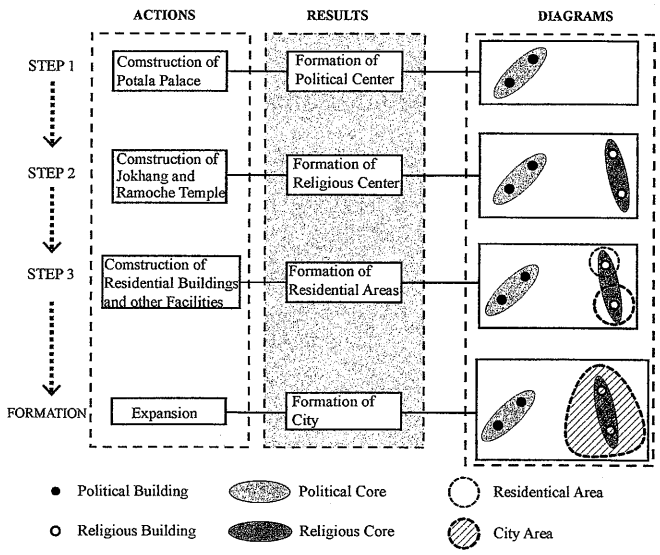


Fig. 3 Formation Process of Lhasa City

Step 3: people reside surrounding the temples and pilgrims also led to the formation of other facilities. Finally, the city formed around religious center.

3.2 Chronological procedures of city development

Since Lhasa city was established as the central city of Tibet in 663, the status of Lhasa City in Tibet has been changed with the process of Tibet's political system. In the history of Lhasa City, Lhasa taking role of capital of Tibet in three periods resulted vigorous construction of city. Therefore, researchers see these three periods as the developing peaks of Lhasa City [13], shown as Table 1.

In the first peak, after Tibet was unified during the seventh century, Songtsan built Potala Palace, Jokang Temple and Ramoche Temple in the city. Accordingly, the Lhasa City was originally established around the two temples.

However, the Bod regime collapsed in 842. During the split period from 842 to 1642, Lhasa City hardly developed

Table 1 Chronological Development Procedure of Lhasa City [13]

	~633	633~842	842~1642	1642~1959	1959~	Characteristics
The first peak		**Period of Bod Domination**				◆ Construction of Potala Palace, Jokang Temple, and Ramoche Temple ◆ Formation of city
The second peak				**Period of Religious Based Governing System**		◆ Construction of the three major monasteries ◆ Repair of damaged religious buildings ◆ Religious significance of city increased ◆ Development of infrastructure
The third peak					**Period of PRC Domination**	◆ Strengthening of external traffic; ◆ City expansion ◆ Urbanization of city

in this split period because of the wars and instability. Moreover, the temples and Potala Palace was destroyed in this period also.

After the Tibetan Buddhism governed Tibet in 1642 A.D., Lhasa City became the central city again and ushered in the second peak of urban development. In this period, Potala Palace was rebuilt and became a religious-political building. Moreover, three monasteries were built in Lhasa region and two of them were near of the urban area. As a result, the connection between Lhasa City and the two monasteries was established.

In the third urban developing peak from 1959, Tibet being under the jurisdiction of new People's Republic of China, Lhasa City has been obviously expanding and transforming in the process of rapid urbanization.

3.3 Urban form of Lhasa City before Urbanization

Before the third urban developing peak, Tibetan cities experienced natural transformation. As a result, mature and stabilized urban structures were formed. Form the map in 1885 of Lhasa City published in <Indian survey>, the features of urban form in 19th are reflected (fig. 4).

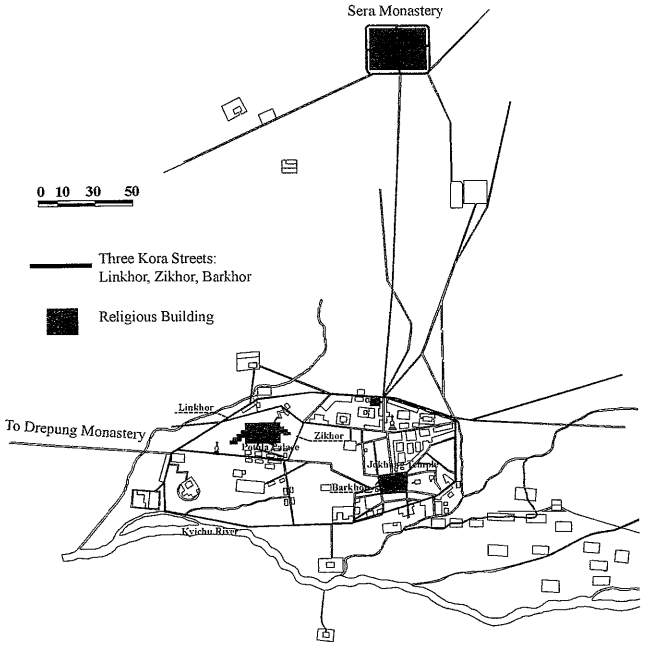


Fig. 4 Diagramatical Map of Lhasa City [5]

1) In 19th, Lhasa city was compacted around Potala Palace, Jokang Temple and Ramoche Temple. However, the buildings and facilities are comparatively concentrated in areas around religious buildings.
2) A large number of religious buildings were built. It can be reflected from the map that besides the two temples inside city area, two monasteries were located in the north and west of city. In addition, the Potala Palace took role of religious-political building under the religious based governing system.
3) The street network inside city can be reflected from the map. Meanwhile, the roads leading to outside of the city were only functional settings as connection of the two important monasteries and city.
4) In this period, the three KORAS Streets for walking prayer in Lhasa City were formed. Two KORAS Streets surrounding the Jokhang temple and Potala Palace named as Barkhor and Zikhor respectively. Moreover, as the religious center of Tibet, Lhasa city has one Koras street named Linkhor surrounding the city area besides the other two Koras streets.

4 TRANSFORMATION PROCESS OF LHASA CITY

4.1 Physical Transformation of Lhasa City

The modernization of Lhasa led to rapid urbanization of Lhasa City in the last decades. Subsequently, in the process of urbanization, Lhasa City experienced growth and expansion. By investigating the maps of Lhasa in the last 60 years, this study analyzes the transformation features of urban structures. Fig. 5 reflects the situation of city in 1956, 1970, 1985 and 2007, from the aspects of constructed areas and street network. The map in 1956 shows a similar urban form in 1885. Accordingly, this study can clarify the characteristics of transformation as follows:

1) In case of the expansion steps, the city expanded three steps which are shown in fig. 6 First, in step 1, Potala palace, the religious-political core, attracted the city expansion; subsequently, in the second step the spaces inside Linkhor are fulfilled by buildings and facilities, as well the city started to expanded to the west and north; at last, the flat land in north of Kyichu River was fulfilled and the city expanded to the south of river after the railway station was built.
2) From the direction of city expansion, it can be reflected from fig. 6 that the city mainly expanded to the two

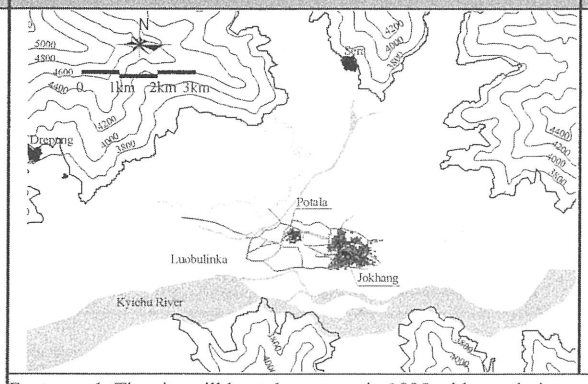
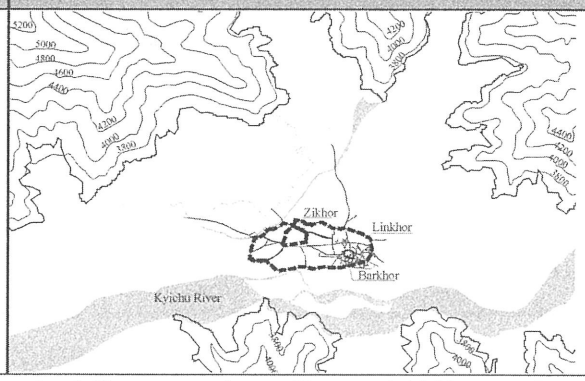
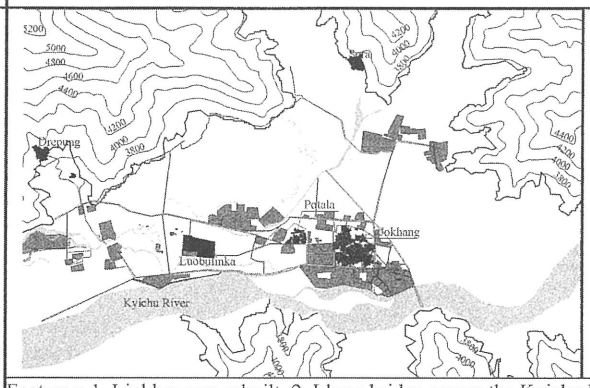
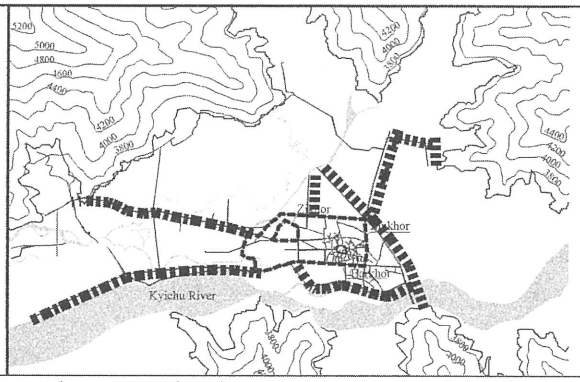
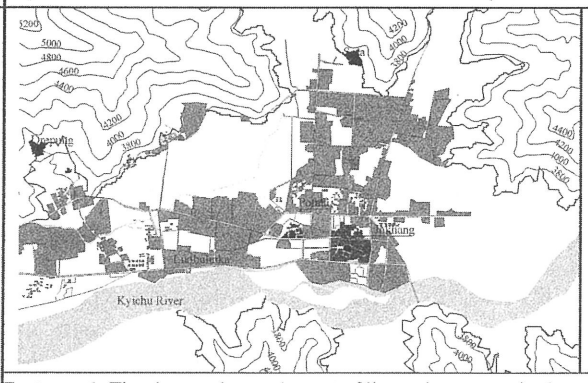
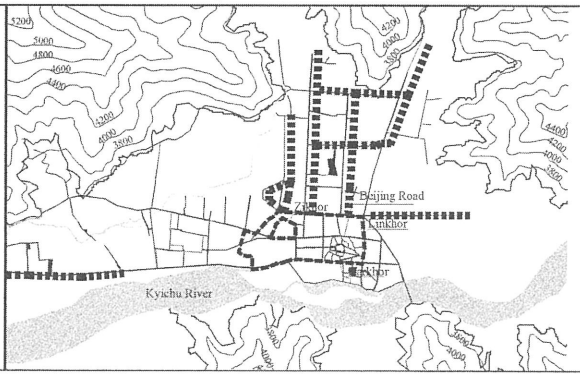
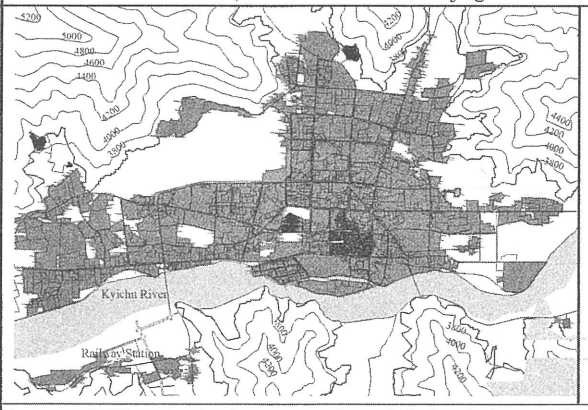
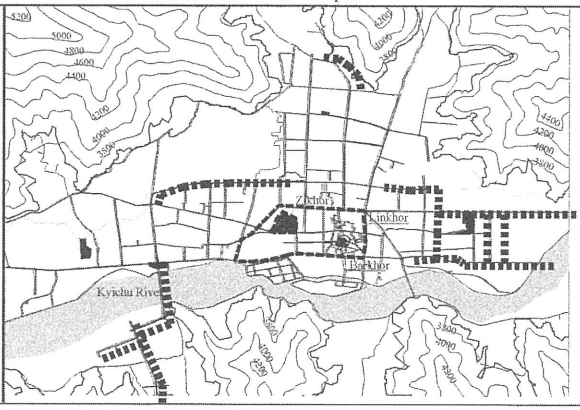
	URBANIZED AREA	STREET NETWORK
1955		
	Features: 1. The city still kept the pattern in 1885 without obvious expansion; 2. The constructed area still surrounded Jokhang temple and Ramoche temple; 3. Two roads stretched to Drepung monetary and Sera monetary	
1970		
	Features: 1. Linkhor was rebuilt; 2. Lhasa bridge across the Kyichu River and streets stretch to the north and west were built; 3. The city expanded out of the linkhor which had been the boundary of Lhasa City to the north Shore of Kyichu River	
1985		
	Features: 1. The river at the north-west of lhasa city was revised to underground for the urban development; 2. The city significantly expanded towards the north and west; 3. One street named Beijing road was built and divided the historic area into two parts.	
2007		
	Features: 1. The urbanized areas experienced obviously internal densification; 2. The city expanded to the east finally; 3. the construction of railway station in the south coast of Kyichu River caused the city expanded to this area.	

Fig. 5 Chronological Urban Transformation of Urbanized Area and Street network in Lhasa City [5), *1), *2)]

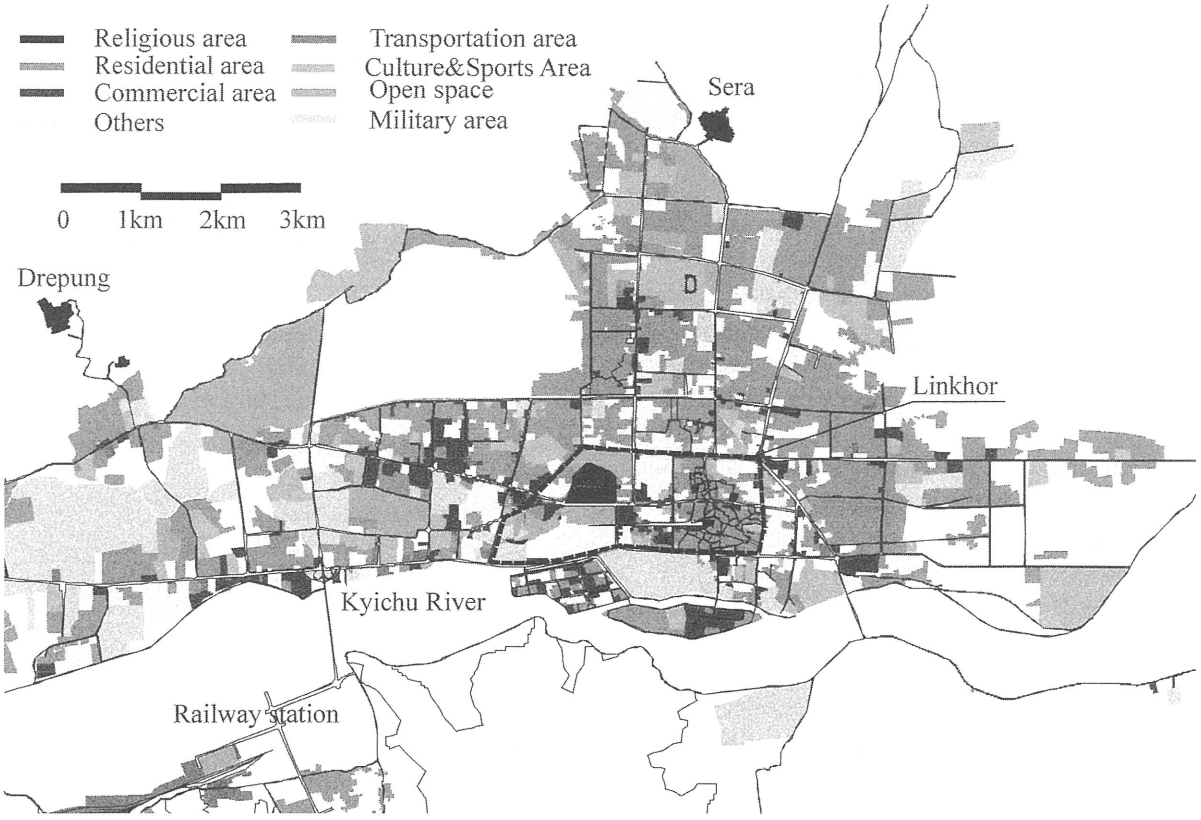


Fig. 7 Land Use of Lhasa City in 2007 *3)

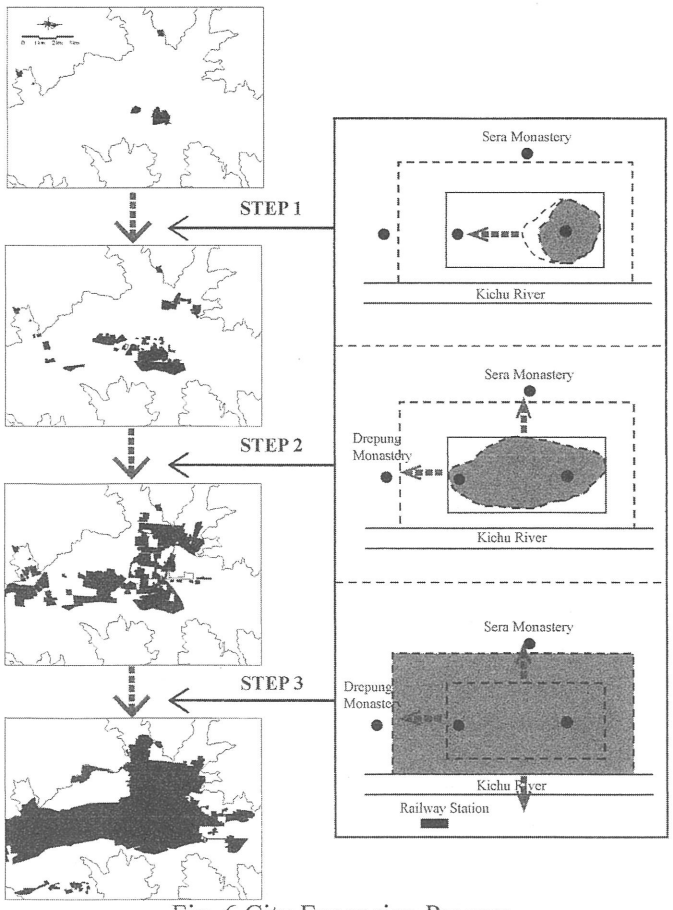


Fig. 6 City Expansion Process

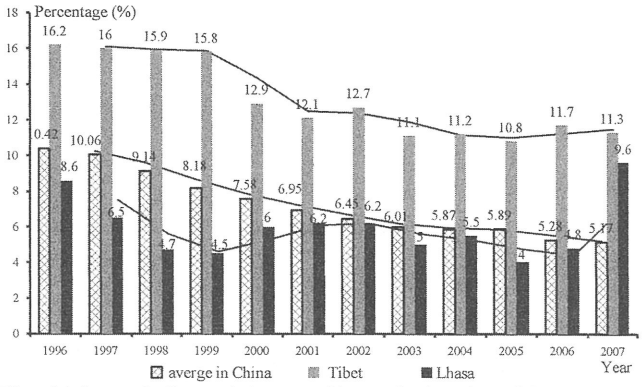


Fig. 8 Natural Growth Rate of Population in China, Tibet, and Lhasa, until 2007 1), 2), 3)

temples in the north and west at the second step. Furthermore, the city experienced the expansion to the east and south.

3) Within the process of urbanization, the street network has been transforming and expanding. With the restriction of topography, the street network of Lhasa City cannot radiate as circle streets from the city center. Therefore, the street network expanded based on the two streets extending to Drepung Monastery and Sera Monastery.

4) The Kora Streets in Lhasa City also changed with city development. Comparatively, Linkhor changed from the aspects of street shape and location; while little change happened in Barkhor and Zikhor.

5) At last, the situation of land use in 2007 after city

expansion is reflected in fig. 6: a) Residential buildings spread all over the urban area; b) the commercial facilities are mostly concentrated inside Linkhor; c) different types of facilities are surrounding the religious buildings; d) inadequate open spaces are concentrated near of Potala Palace; e) after the construction of railway station in the other side of Kyichu River, some facilities and buildings arise in the surrounding areas.

From the analysis above, we can find that the current form of Lhasa city is a result of transformation under the traction and resistance of religious buildings and natural environment from different orientations (fig. 8).

Furthermore, the largest Koras Street formed because of the koras revolved the whole area of Lhasa city in 19th. However, with the growth of city, the area inside the Koras Street has become to be the central area.

4.2 Socio-economical Transformation

Moreover, Lhasa City has been experiencing transformation in social and economical aspects after the change of political system. This study analyzes the socio-economical transformation in this chapter from the aspects of population, economical composition, and religion.

1) Population

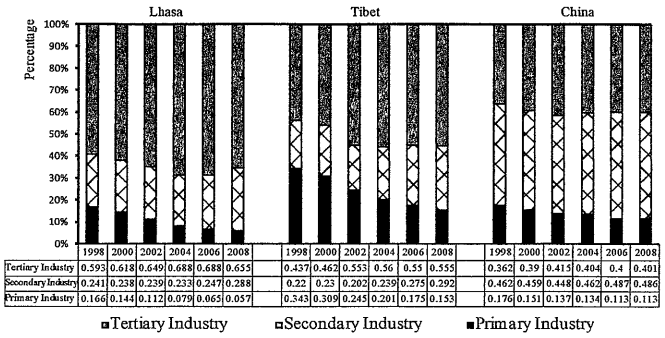
From 1990 until 2008, the population of Tibet increased from 2.18 million to 2.79 million, as well as the population of Lhasa increased from 357 thousand to 477 thousand because of the economical and medical improvement. [1] On the other hand, the percentage of urban population in Lhasa has been increasing in the last decades.

Fig. 7 showing the natural growth rate of population (NGRP) reflects the differences of trends in population growth between China, Tibet and Lhasa. From the observation result we can conclude that: (1). The average NGRP in China keeps decreasing while Tibet has a higher NGRP every year, as well; The NGRP of Lhasa fluctuated in the ten years; (2). the NGRP of Lhasa is mostly lower than the average data of China which is lower than Tibet; (3). The NGRP of Lhasa rapidly increasing after 2006 climbed to top point in 2007 because the construction of railway station promoted the migration of alien people into Lhasa.

In case of ethnic composition of population, the percentage of Tibetan people in total population mainly kept more than 94% when the Han people occupied about 5% and the other nationalities are only 1%. However, the percentage of Han people in Lhasa is 17% which is much higher than the average data of Tibet in 2000. It can be concluded that as the central city of Tibet, the economical development and communication with mainland of China result in the migration of alien people.

2) Economical Composition

The statistics from 1998 to 2008 reflects the higher GDP/P of Lhasa compared with the average GDP/P of China. In case of the composition of GDP, 97.7% of Tibetan GDP from primary industry (agriculture) in 1951



	Lhasa 1998	2000	2002	2004	2006	2008	Tibet 1998	2000	2002	2004	2006	2008	China 1998	2000	2002	2004	2006	2008
Tertiary Industry	0.593	0.618	0.649	0.688	0.688	0.655	0.437	0.462	0.553	0.56	0.55	0.555	0.362	0.39	0.415	0.404	0.4	0.401
Secondary Industry	0.241	0.238	0.239	0.233	0.247	0.288	0.22	0.23	0.202	0.239	0.275	0.292	0.462	0.459	0.448	0.462	0.487	0.486
Primary Industry	0.166	0.144	0.112	0.079	0.065	0.057	0.343	0.309	0.245	0.201	0.175	0.153	0.176	0.151	0.137	0.134	0.113	0.113

Fig. 9 Composition of GDP in China, Tibet, and Lhasa, until 2007 [1), 2), 3)]

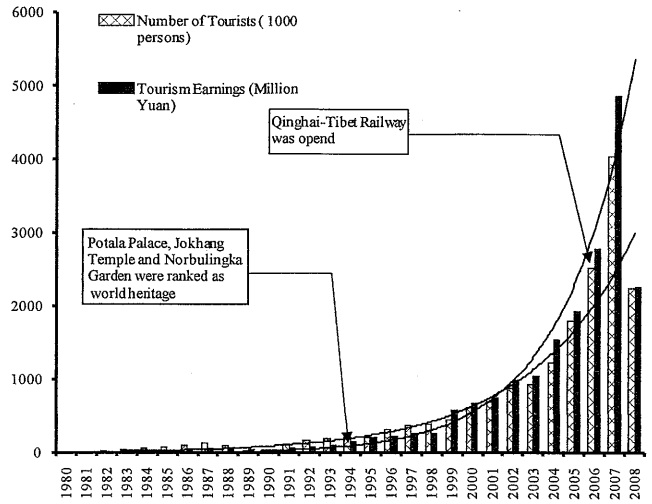


Fig. 10 Growth of Tourism Industry in Tibet [1)]

shows the agriculture based economical system in Tibet 60 years ago. [3)] However, fig. 8 reflects the change of economical system by showing the composition of GDP from 1998 to 2008, as follows:

a) The economical system of Lhasa in which the primary industry takes the smallest amount in GDP, is Tertiary Industry-based system.
b) Moreover, the promotions of the tertiary industry both in Lhasa and in Tibet are comparatively smaller than the average data of China.
c) However, the promotion of primary industry in Tibet is higher than in China and in Lhasa.
d) In addition, with the transformation of economical system, two important events catalyzed the development of tourism industry in Tibet: Potala Palace, Jokhang Temple and Norbulingka Garden ranked as world heritage in 1994, and the construction of Qinghai-Tibet railway in 2006. Hence, fig. 9 reflects the development of Tibetan tourism from the aspects of tourist number and tourism earnings, in the last 30 years. It can be seen that Tibetan tourism experienced the period of slow development before 1990s; however, by the catalyzing of the two events, an obvious growth raised after 1994 and the growth flight to the peak in 2006.

3) Religion

257 Buddhism temples and monasteries are located

in Lhasa region, the religious center of Tibet, while 48 temples inside Lhasa City. However, with the social development, the status of religion in Tibetan society and in people's religious life. According to the previous researches on Tibetan religion, the changes of religion are reflected from the following aspects[4]:

a) The new political system results the Tibetan Buddhism losing the political dominance in Tibetan society.
b) The change of people's lifestyle led by the urbanization, coupled with the immigration of alien people and culture, result in the change of people's religious behaviors.
c) Finally, the political function of religious building was instead by tourism function under the new political system.

5 CONCLUSION

This study focusing to understanding on the transforming features from physical and socio-economical aspects of Lhasa City can get the following conclusions by investigating the maps and literatures.

First, by literature review, this study illustrates the Lhasa City originally formed surrounding the religious center other than the political core. However, after the natural transformation for more than one thousand years, the Lhasa City encompassed both of the religious core and religious-political core. Therefore, the formation of city reflects the influences of Tibetan Buddhism and religious based governing system on Tibetan city form.

Second, by investigating the maps of Lhasa City, this study identifies the physical transformation features of Lhasa City in process of urbanization. Accordingly, the physical transformation characteristics of other Tibetan cities are reflected by the analysis results: a) the religious buildings outside urban areas attract the urban expansion while the religious building inside urban area centralizes the Tibetan cities. b) The harsh plateau natural environment and topography is an important element in urban development. 3) The transport facility takes important role in city expansion after modernization.

In addition, from the analysis on the socio-economical transformation, this study point out possible problems facing the Tibetan cities: a) the request for protection of local culture in urban design with the immigration of alien people and culture; b) the urban facilities taking the change of people's lifestyle into consideration; 3) the importance of tourism reflected by the Tibetan economical system requests construction of tourism facilities and management of tourism industry.

Acknowledgement

The authors acknowledge for the supports of Natural and Science Foundation (50921005) of China.

Note

*1) In Tibet, Kora paths are a series of paths that surround particular sacred places and where the walking prayers take place. There are three streets taking role as Kora paths inside Lhasa City: Barkhor, Zikhor and Linkhor.

*2)The maps were drawn by the authors based on the satellite photos of Lhasa City from the book: Lhasa City Atlas (LHCA) .

*3) Source: Lhasa Master Plan (2007-2020): Construction Bureau of Tibet Autonomous Region, China.

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（受理：平成23年6月2日）