

# Study on the Urban and Regional Planning of Post 2008 Sichuan Earthquake Restoration, China — Case Study on the Relocation and Reconstruction Plan of Beichuan County Seat—

2008 年中国四川大地震後の復興における都市・地域計画についての研究  
—北川県都の移転計画と復興新都市計画に着目して—

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2008年に中国四川省を襲った四川大地震により北川県の旧県都は80%の家屋が倒壊する壊滅的被害を受けた。旧県都は再建不可能と判断され、約24km南に位置する平原に復興新都市を建設し、被災者はそこに集団移転されることとなった。この計画は「民主的かつ科学的判断の重視」を謳う政府の指導のもとで策定され、迅速かつ広大な復興が成し遂げられた。本研究では復興の総合計画の概要を文献等を用いて把握し、総合計画が県都の移転計画にどのような影響を及ぼしたのかを考察した。その結果、移転計画は経済発展や都市の拡大を目指す復興の総合計画や既存の政策に大きく影響を受けていることが分かった。また北川県での現地調査により、生活様式と都市機能との不一致、不適切に巨大な都市計画による一部の地区の衰退、被災地域間での支援規模の違いによる地域格差などの問題が生じていることが明らかとなった。

**Keywords:** Sichuan Earthquake, post-disaster relocation, regional planning, urbanization, reconstruction policy  
四川大地震(汶川大地震)、防災集団移転、地域計画、都市化、復興政策

## 1. Introduction

### 1.1 Background

The Sichuan Earthquake that occurred on May 12, 2008, was the strongest earthquake to have occurred in China in the past 50 years with a magnitude of Ms8.0<sup>(1)</sup>. Beichuan Qiang Autonomous County (hereinafter Beichuan), Mianyang City, Sichuan Province was one of the most heavily stricken areas. Beichuan's former county seat, Qushan Town, lost more than 40% of its population, and 80% of the buildings there were destroyed. Shortly after the quake, the central government decided to give up on-site reconstruction of Qushan. Consequently, the remaining residents of Qushan and several neighboring villages were relocated to Yongchang: a newly constructed city established in a geologically safer area 24 km south of the original town.

In less than three years, a dynamically constructed modernized city emerged from an ordinary farm village. The planners sought development and modernization: the city was planned to eventually cater approx. 70,000 residents, which was greater than the original collective relocated population of 30,000. Beichuan's restoration is a proclaimed to be an extremely successful example of regional rejuvenation amongst Chinese development theorists and officials.

### 1.2 Objective

The objective of this study was to analyse the reasons to why Beichuan County seat was decided to be relocated to Yongchang. The study focused on the decision-making process through official reports, and analyzed its relationships with overall restoration plans and policies specifically designed for Sichuan's restoration. Ultimately, the efficiency and degree of actualization of the policies and plans were evaluated through field investigation conducted in Beichuan. Furthermore, the study examined pre-existing land-use

planning policies in China that had similarities with the restoration plans, and discussed the possibility of its influence to Beichuan's relocation plan.

### 1.3 Methodology

Firstly, a preliminary overview of the impact and responses of the Sichuan Earthquake was conducted. Secondly, restoration and reconstruction plans were studied, especially in sections that were related to land-use planning. Information was gathered using official reports, and reviewing references. Thirdly, field investigation was conducted in Beichuan, which included interviews with locals, and acquiring information from the local government and quake-related museums. Beichuan had growingly become an eminent symbol for post-quake rejuvenation. It underwent drastic reformations under direct administration of central-government institutions, and therefore was an appropriate site to investigate influences from the top-down planning mechanism of the Sichuan restoration.

### 1.4 Reference Review

Miyairi<sup>1)</sup> has researched the characteristics of the disaster impact and overall ideology of restoration objectives from an external point of view. Ge, Yongtao and Wugong<sup>2)</sup> reviewed the Chinese style top-down planning mechanism of restoration, and discussed if restoration plans were consistent with local demands. Abramson and Yu<sup>3)</sup> discovered similarities between characteristics of the restoration and China's pre-existing national policies.

The comparison between the overall restoration ideology, the local-level city plan (in this case Beichuan), and what was actually practiced were not extensively covered in the previous references. Hence, the study aimed to review all of the above three aspects, and focus on its similarities and possible influences.

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## 2. Preliminary Overview

### 2.1 Objective Area

Sichuan is an inland province in the southwest area of mainland China. Sichuan can be geographically categorized in two regions: the lowlands of Sichuan Basin, and the elevated mountainous region. The Longmenshan Mountains are located on the margin of the mountain areas. Chengdu, the provincial capital city of Sichuan, is located in the western area of the basin along with other major cities. Beichuan County is under the jurisdiction of Mianyang City. Yongchang, the current Beichuan County seat, is located approx. 120 km northeast of central Chengdu. (Fig. 1)

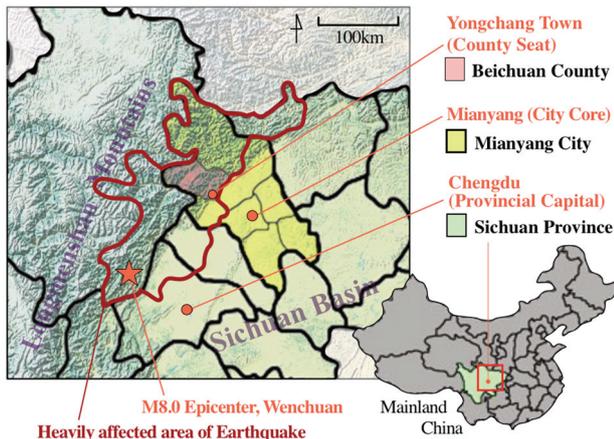


Fig. 1: Map of northeastern Sichuan and disaster area

### 2.2 Impact of the Sichuan Earthquake

The M8.0 Sichuan Earthquake, occurred on May 12, 2008. 87,150 people were officially announced dead or missing, and the estimated direct economic loss was 845.1 billion CNY<sup>(4)</sup>. Out of all earthquakes worldwide since 1900, it had the seventh largest death toll<sup>(5)</sup>, and the third largest direct adjusted economic loss<sup>(2)(6)</sup>.

Starting from Wenchuan, the epicenter, ruptures transmitted over a total length 270 km northeastwards through the Longmenshan fault zone: a series of seismically active faults stretching alongside the northwest perimeter of Sichuan Basin. Casualties showed a strong correlation with the Longmenshan fault zone. The area defined as “Heavily Affected” (counties/districts with more than 500 deaths) is contoured in red in Fig. 1. Wenchuan, had the highest death toll followed by Beichuan. The quake damaged more than 53,000 km of roads, and 7.8 million buildings have collapsed<sup>(1)</sup>.

While the earthquake caused many deaths in the mountain region due to geo-hazards such as landslides, there were huge economic losses with urban infrastructure and public facilities in the urban areas in the lowlands.

### 2.3 Rescue and Relief

The central government was quick to respond and showed powerful leadership in mobilizing the armed forces. Approx. 200,000 armed forces personnels<sup>(3)</sup> were dispatched: the largest scale the ever mobilized for a non-combat purpose<sup>(4)</sup>.

There were also features new to China seen in the rescue operations. Millions of Chinese volunteers rushed to the disaster area. Year 2008, has been regarded as “The Year of the Volunteer”. The government accepted foreign rescue troops and relief support, and maintained a fairly open attitude towards media coverages.

## 3. Restoration and Reconstruction Plans

### 3.1 Restoration Ideology

There were three important aspects that were distinct with the earthquake’s damage that have influenced the preplanning of reconstruction. Firstly, the ethnic minorities (especially the Qiang) were the most severely affected, and the conservation and rejuvenation of their culture was of utmost importance. Secondly, the earthquake impacted both the urban and rural regions. Each regions’ original features and the integrity between urban and rural areas were put into consideration. Lastly, due to the high death tolls in the mountain region, the geological security of the reconstruction was required to be carefully evaluated before executing reconstruction. This led to the prevention of large-scale reconstruction in towns of the mountain region.

On June 8, Premier Wen Jiabao promulgated the “Regulations on Post-Sichuan-Earthquake Restoration and Reconstruction”: a powerful guideline that clarified restoration objectives. Hereby, recovering the lives of victims and developing the economy and society was determined as the ultimate goal for restoration<sup>(1)</sup>.

### 3.2 City/Town Plan

The “City/Town Plan” was initially proposed on July 23. This plan defined each area’s appropriateness to resume production, and the adjustment of the infrastructure layout of townships. The plan’s idea was to design a logical urban layout system which will facilitate restoration and realize a robust development<sup>(2)</sup>.

The “Capacity Assessment Report” was created beforehand which evaluated the overall capacity that each environment has by analyzing its degree of development, economic orientation, population density and ability of urban facilities. The majority of the mountainous area around the Longmenshan belt was evaluated as “Ecological Reconstruction Areas”: areas that were evaluated vulnerable to disasters and natural hazards. Many towns in these areas were already experiencing severe shortage of construction space and were in hazardous state. On-site reconstruction and population aggregation was suggested to be restrained in this area.

Referring to this assessment report, by the China Academy of Urban Planning and Design<sup>(3)</sup> (hereinafter, CAUPD) proposed a spatial development network of cities and towns (Fig. 2)<sup>(2)</sup> in the “City/Town Plan”. This signified the Chengdu-Deyang-Mianyang

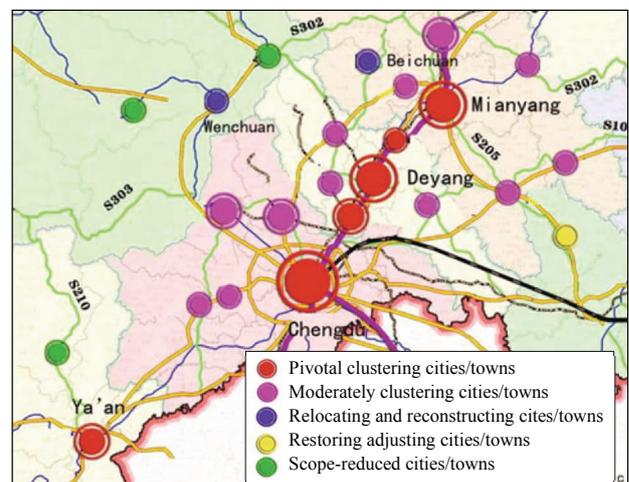


Fig. 2: Plan of urban network in the severely damaged area (partial) (source: Yue Ge, 2010)

economic belt as the primary axis for development, and periphery cities as the secondary development zone which aimed to benefit from the development of the primary axis. On the other hand, the expansion of mountain towns were strictly regulated. The recovery of tourism and agriculture were only allowed to a certain extent, and large-scale industrial development was generally renounced.

The “City/Town Plan” is very much similar to the “Urban Rural Integration”: a normative policy from the 1980s objective to seek a new balance of urban and agricultural land uses and to mitigate negative environmental and social impacts of urbanization with comprehensive planning<sup>3)</sup>. The policy defines an “urban zone” where population migration from rural towns is promoted, and simultaneously aims to expand the “urban zone” to peripheral undeveloped suburbs. In the “City/Town Plan” the restrictions of mountain areas was appended. A concept similar to the “urban zone” was seen, but substantially extensive covering multiple cities and largely seeking migration from the mountainsides.

### 3.3 Restoration Master Plan

On August 27, the “Overall Planning for Post-Sichuan Earthquake Restoration and Reconstruction” was issued. This was the first and most important document concretely describing the entire scheme of reconstruction. The plan estimated the total capital demand for the initial restoration and reconstruction at 1 trillion CNY. The government promised to establish a funding system to support approx. 30% of the aggregate demand by facilitating international loan systems and utilizing the “Counterpart Assistance” policy. The initial stage of reconstruction was declared to be completed within three years<sup>4)</sup>.

The distribution of reconstruction funds were highly concentrated on building economy-related infrastructure, such as highways, railways, airports, network systems, energy facilities, and dams. On the other hand, investments in reconstructing residences were relatively low. Although there were some subsidy, the amount was insufficient for most victims to afford new houses. The majority of houses were “self-built” by the victims with the small amount of subsidy and loans<sup>1)</sup>.

## 4. Beichuan Relocation

### 4.1 Prerequisite Decision-Making

All reconstructions were required to prioritize “scientific and even-handed decision-making”. In the case with Qushan Town, on-site reconstruction was judged unfavorable. Secondary geological disasters induced by the earthquake destroyed the environment of the city so completely that reconstruction of the town in this location was impractical. The Beichuan-Yingxiu fault, (one of the main fault lines of the Longmenshan belt) runs through the center of the urban area. The city was still highly perceptible to landslide hazards, which killed 2,100 in the quake. In order to prevent further casualties and properties losses by aftershocks and secondary disasters, relocation was deemed inevitable<sup>7)</sup>.

CAPUD was assigned as the chief planning institute for Beichuan’s reconstruction. After CAUPD conducted several field investigations, geological conditions and public opinions were put into consideration, and Qushan was decided not to be rebuilt. Choosing an alternate site was the next step for reconstruction.

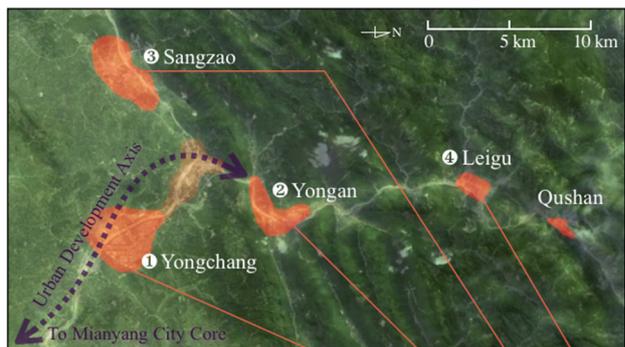
### 4.2 Site Selection

Within the first week after the disaster, a project team to rebuild the new county seat was launched formed by the CAUPD and the central government. Four candidate sites were chosen by late June: 1)Yongchang, 2)Yongan, 3)Sangzao, and 4)Leigu. (**Fig. 3**)

Yongan and Leigu were open areas in the valley of Anchang River. The landscape resembled that of Qushan, but was disadvantaged for its geological safety and lack of development area. Sangzao had advantages with its urban facilities and some Qiang Cultural sites, but was disadvantaged for its inconvenient location. Yongchang was located outside the mountainous area, on the margin of the lowlands of the basin. The city was conveniently located on the urban development axis, and had the most space open for development. The site’s biggest disadvantage was the distance from Qushan town: approximately 24 km apart.

Ultimately, the site-selection process was a choice between the preservation of landscape and culture, against the aspiration for social/industrial development and ensuring geological security. Yongchang outclassed the primary “geological conditions” criteria, thus was conclusively selected as the optimal site for reconstruction. In the “Capacity Assessment Report” Qushan, Yongan, Leigu and a portion of Sangzao were categorized as “Ecological Reconstruction Areas”. This meant Yongchang was the only site candidate that permitted the execution of a large-scale urban reconstruction. In addition the location of the city was in good accordance with the “City/Town Plan” with potential to serve as a secondary development zone.

Yongchang was decided as the final candidate around August, and the relocation plan was ratified by State Council in November. In December, a poll was conducted against survivors of Qushan to find out whether the relocation to Yongchang will gain their support. In result, 95% were in favor<sup>8)</sup>. One possible reason for the little opposition is the experience from the previous relocation. In 1952, Beichuan County seat was relocated from Yuli to Qushan, because



Criteria	Candidates	①	②	③	④
Geological conditions and security		A	C	C	D
Other factors	Regional conditions	A	C	D	C
	Site conditions	A	B	C	D
	Municipal infrastructure conditions	B	C	D	C
	Social service facilities	D	C	C	C
	Administrative divisions affect	C	B	D	A
	Qiang culture shaping and display	A	C	C	A
	Environmental landscape conditions	A	C	D	A
<b>Comprehensive evaluation</b>		<b>A</b>	<b>C</b>	<b>D</b>	<b>D</b>
Approx. distance from Qushan (km)		24	15	27	5
Approx. distance from nearest fault (km)		over 4	0.3	under 1	0

Fig. 3: CAUPD’s evaluation criteria and location of candidate sites

of Qushan's proximity with the lowland cities. Despite multiple efforts to return the county seat to geologically safer Yuli, this was never realized<sup>9)</sup>. The fear against landslides had already been deeply rooted in the minds of the locals long before the quake.

### 4.3 Current Status

With powerful government leadership and counterpart assistance of Shandong Province, the motto for the reconstruction in Yongchang "three years of reconstruction finished in two years" was accomplished. By September 2010, new houses in Yongchang were provided to all Qushan survivors, and the construction of basic urban facilities were proclaimed to be completed. Qushan is preserved as a memorial relic site, and nearby the site the Beichuan Earthquake Museum was opened up in 2011.

Field investigation was conducted in October 2014 in southern Beichuan, mainly in Qushan and Yongchang.

In Qushan, the disparity between the relocated areas and not relocated areas were evident. In Xishanpo, a village 1 km away from Qushan Town, there were damaged houses abandoned in dangerous condition untouched after the quake (Fig. 4). Interviews with the locals revealed that, while the beneficiaries of the relocation project were all ensured new houses, there was not much compensation for others, such as the villagers in Xishanpo. The villagers received little subsidy to buy or reconstruct their houses, and some were still in severely impoverished condition.



Fig. 4: An abandoned damaged building in Xishanpo

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In parts of Yongchang, there were evident failures in the city layout and reformation of lifestyle. The city plan aimed to expand the city's population to 50,000 by 2015. However, the population was still under 30,000 at the time of visit. Hence, there were many areas with very low social activity. Relocated farmers were not provided farm land, but instead were provided training programs to become workers in the Qiang culture tourism and manufacturing industry. The faulty use of open land as farming space (Fig. 5), and abandoned buildings in commercial and industrial districts (Fig. 6), conveyed that unfamiliar land use patterns and lifestyle reformations resulted in social-culturally inappropriate settlement layouts<sup>2)</sup>. Similar issues have been seen from the "Socialist New Village Construction": government-funded projects to reconstruct undeveloped rural villages by rationalizing the environment and modernization of infrastructure<sup>3)</sup>. These projects often improved living conditions but also threatened the self-sufficient family farmers<sup>3)</sup>, which was also the case for Yongchang.



Fig. 5: Vacant store slots in southern Yongchang



Fig. 6: Farmers unlawfully harvesting in a vacant lot in central Yongchang

### 5. Conclusion

The Sichuan Earthquake widely affected the urban and rural areas and this created an incentive to implement extensive urbanization policies in the restoration plans. As a result, the restoration plans were generally in alignment with pre-existing policies that promote the expansion of urban areas in peripheral rural regions. The "City/Town System Plan" foresaw the demographic shift towards urban areas, and directed investment funds to economic-related infrastructure to these regions. However, the restoration plans overlooked the issues that were already being caused by migration towards urban areas. Disparity was a serious issue in the mountain villages that did not receive benefit from restoration projects, and their sustainability is now threatened by the region's drastic demographic change. At the same time the excessively large city plan and radical reformation of lifestyle in Yongchang caused an instability with its urban structure and the self-reliance of communities. The top-down planning mechanism indeed did contribute to a fast-paced and well-funded restoration, but it is anticipated that Yongchang will not be able to maintain its excessive urban scale and industry-oriented society.

The extraordinary rejuvenation of Beichuan would not have been possible without the government's powerful leadership and top-down planning mechanism, but they inevitably caused their distinctive consequences. A region's urbanization and restoration are two independent matters. Their principles may at times share similarities, but they should not be interlaced. It is necessary to calibrate the efficiencies and influences of the plans in accordance to each specific site of restoration, and to contrive to mitigate their risks.

### Annotations

- (1) The China Earthquake Administration revised their initial magnitude announcement from Ms7.8 to Ms8.0 on May 18. The U.S. Geological Survey reported Mw7.9.
- (2) Absolute losses as per the 2012 HNDECI-Adjusted US Dollar direct economic loss value.
- (3) Of which 137,000 are from the People's Liberation Army (PLA), 52,676 from PLA Militia and Reserved, and 20,460 from People's Armed Police.
- (4) CAPUD is a Chinese planning policy advisor, positioned directly under China's Ministry of Construction.

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