Post-quake Reconstruction Planning and Implementation for Beichuan New Town

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Figure 1: Aerial view of Beichuan old town after the earthquake, CAUPD

History will always remember the devastating earthquake at 2:28pm on May 12, 2008 in Wenchuan, Sichuan Province in the hinterland of China. As a result, tens of thousands were killed and tens of millions became homeless. Beichuan's old county town was swept by a rubble-landslide strike, buildings collapsed, bridges crumpled, and roads caved in (Figure 1). It was the most heavily hit area in the earthquake. Beichuan's old county town is situated in an area highly prone to geological disasters and therefore consistently exposed to the threat of collapses, landslides, mudslides and other geological disasters. The May 12th earthquake triggered many collapses and landslides which caused great harm and made post-disaster management extremely difficult, while the upstream barrier lake formed by the earthquake was also a serious threat to urban safety. Therefore, based on considerations of geological conditions and urban development, in-situ reconstruction was neither appropriate nor plausible. Thus, choosing an alternative location became the most important issue facing the construction for the new county town of Beichuan. After fully listening to the views of local people, planners from China Academy of Urban Planning and Design (CAUPD), together with geological experts and local government officials, completed the "Beichuan Post-earthquake Reconstruction Site Selection and Planning Study". The Study carefully scrutinized several alternative sites in terms of their geological, transportation and spatial conditions and took into consideration the demand for future regional development, townscape shaping and the possibility of administrative boundary adjustments before proposing relocation across

administrative boundaries. After being approved by the central government, the new county town of Beichuan was set within an area of ten square kilometers transitioning from river valley flatland to basin southeast of Anchang (Figure 2). The subsequent landslide in September 2008 that buried the old county town once again proved the decision to relocate vital.

Figure 2: Panorama of Beichuan New Town's location southeast of Anchang, CAUPD

1. Planning Background

1.1 Complexity

(1) Social concerns

After the disaster, the Party and state leaders were very concerned about the reconstruction of Beichuan county and made important instructions on many occasions, pointing to the local people's livelihoods and development as the primary issues of the reconstruction. They called for a plan that would build Beichuan as a landmark of urban construction, anti-disaster spirit and cultural heritage and a new county town that embodies "safety, livability, prosperity, uniqueness, modernness, and harmony". Compatriots from Hong Kong, Taiwan and Macao and overseas Chinese donated funds, and expressed great concern and high hopes about the reconstruction of Beichuan. The amount of attention and the high expectations the planning and construction work shoulderered is self-evident.

(2) A labyrinth of issues

The relocation of an entire county town generated numerous issues. Planning and building a new county town on a very small piece of land required consideration of a variety of issues including: the resettlement of the affected population, the rehousing of farmers to the new site and relocation of county-wide farmers who lost land due to the disaster. In addition, to provide for people's livelihoods, industrial development within the new county had to be compatible with the employability of residents. Not only did the new county need to restore urban functions quickly, it also had to leverage the change of transportation location to better organize the various types of spatial resources and provide better support for the county's urbanization process. Furthermore, due to the cross-administrative boundary relocation, the planning also needed to coordinate with the hosting county for better communication and resource sharing.

1.2 Urgency

On the first anniversary of the Sichuan earthquake, out of concern for the affected-population's lives and the general progress of disaster-relief efforts, the central government called for a plan to "intensify and accelerate progress, as well as strive to complete scheduled task one year ahead, so people in the disaster area can live a happier life as soon as possible". The prudent site selection process provided an optimal space for the new county seat's future development but took a significant amount of time. The short timeframe and heavy workload made the reconstruction of Beichuan new county town one of the most onerous tasks of disaster relief. Therefore, planning and construction work needed to prioritize the development, design reasonable steps, and coordinate needs from all parties. It also needed to rely heavily on reconstruction forces in order to achieve the rapid recovery of urban function (under the special request of the central government) with limited time and funds while still preserving room for future development.

2. Strategies

In accordance with the central government's demand and in coordination with the aid scheme from the Shandong-province partner, CAUPD adopted work principles that focused on a "government-directed, expert-led effort with cross-agency cooperation, public participation and scientific decision-making". CAUPD set core tasks as "to properly settle the affected-population, restore the county seat function, and lay down foundations for long-term development". Taking into account the pragmatic and experimental aspects of the reconstruction effort, CAUPD applied "six synergies" in the technical approach, combining innovative ideas with applicable measures, planning strategy with planning construction, sector planning with engineering construction, planning regulation with construction management, government intention with resident expectation, and spatial layout with urban design.

2.1 Innovative Ideas and Applicable Measures

The entire planning process focused on comprehensive, coordinated and sustainable development principles. Advanced design concepts were adopted with existing norms when practical work needed innovation. Appropriate implementation measures were utilized to achieve successful realization of design concepts: A spatial pattern with a convenient public infrastructure system ("chain") and livable philosophy ("dots") ensures walkability for residents.. Concepts emphasizing non-vehicular transportation and traffic calming are refined in cross-section design, intersection design, slow traffic system design and green landscape design (Figure 3). Energy saving and other green concepts were implemented in the town's energy structure, including water recycling and green building promotion initiatives.

Figure 3: Implementation of non-vehicular transportation and traffic calming concepts: vehicle blocking stone, pedestrian-bicycle lane, and pedestrian island, CAUPD

2.2 Planning Strategy with Planning Construction

The new county town's master plan focused on settling the affected-population as quickly as possible through the implementation of aid partnership projects that could restore urban function promptly. The core work in planning was to prioritize and streamline regulatory planning and emphasize "shared collective construction". Through this kind of "project combing", the plan successfully compressed approximately 50,000 square meters of public construction and avoided wasting available urban construction land. For scheduled projects, the planning process rigorously followed work procedure from case reporting, plan review, size determination, site layout, design solicitation, design review, and construction supervision.

2.3 Sector Planning with Engineering Construction

Instead of seeking the depth of sector plans and the design of engineering and construction, the overall goal of the new county town's master plan was to initiate the new town's construction by linking sectors plan with specific construction projects and enhancing the control and guidance on construction designs of sector plans. For example, the transportation sector plan focuses on the analysis and design of street block entrances and exits, roadside parking, non-vehicular travel, handicap access, intersection control, etc. The municipal sector plan conducted a special study on the urban water system, which provided strong support for the landscape pattern design. The in-depth comprehensive design of utility provision emphasized the control on municipal utility stations, pipeline diameter and other vertical and horizontal elements and timely communication with construction design. A special study on municipal infrastructure authorized franchises to lay the foundation for subsequent management.

2.4 Planning Regulation and Construction Management

The old county town of Beichuan was a remote, ethnic-minority area. There used to be a lack of institutional mechanisms and technical expertise for urban construction and management. Targeting this issue, the reconstruction planning prepared Management Measures of Project Selection for The New County Reconstruction, which put forward regulations for respective planning and construction procedure in the short-term. Through the establishment of a modern planning and management system based on geographic information system (GIS) technology, plan visualization and an information management system (Figure 4), the plan sought to reform the planning management approach, enhance management efficiency and improve management control and quality for the purpose of expediting local government's

administrative work.

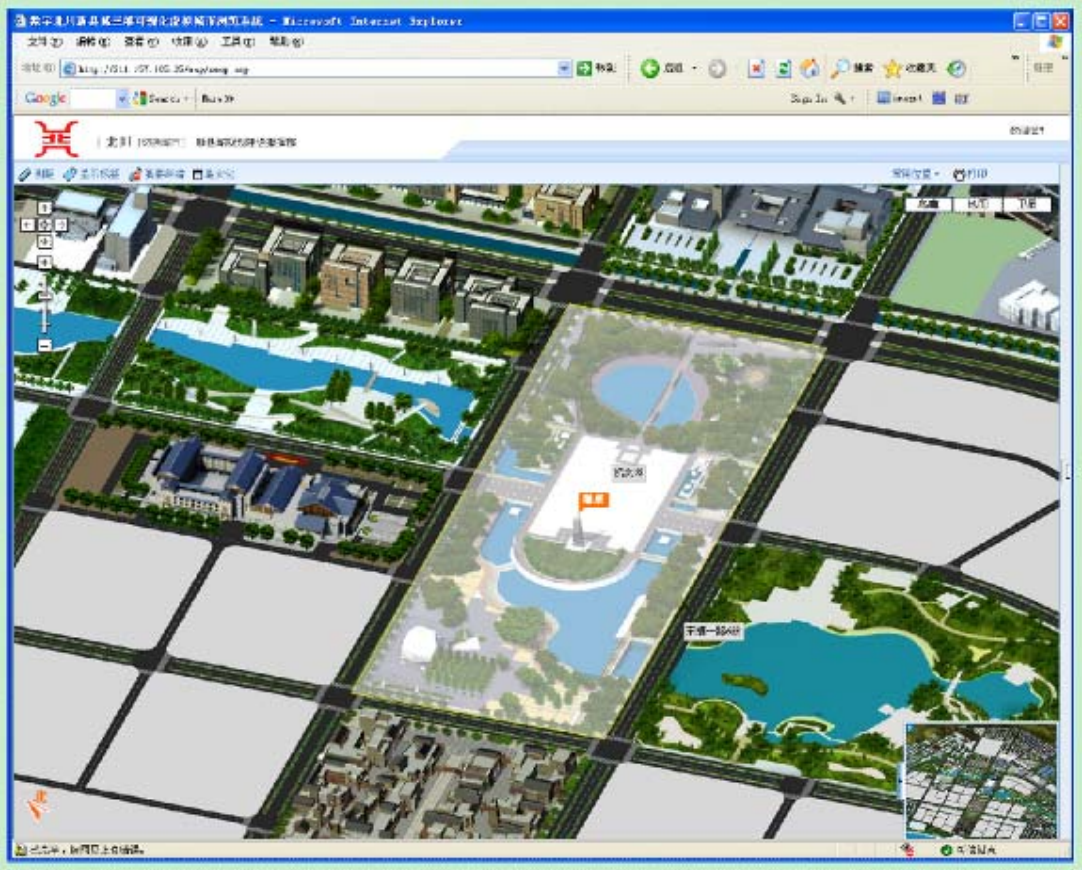

Figure 4: Visualization of planning outcome, CAUPD

2.5 Government Intention with Resident Expectation

Throughout the new county town's planning process, public participation was a high priority. Seven field surveys were conducted on site selection, master planning, land acquisition, housing policy, and landless farmers. Through public display and exhibition of planning outcomes, planners were able to better communicate with the public and have them actively participate in their own city's reconstruction (Figure 5). Public opinion constitutes a solid basis for government decision-making, as planning serves as an instrument for public policy.

Figure 5: Photos of public partipation events, CAUPD

2.6 Spatial layout with urban design

Urban design was embedded throughout the entire master planning process. It proposed a spatial structure and activity system that consisted of an ecological corridor, a facility chain, a leisure belt, a landscape axis and a growth ridge (Figure 6). The overall spatial layout features local architectural style, an encompassing mountainous view, and human scale while most importantly being enriched with ethnic minority characteristics.. Urban design was also a prominent component of public participation and outreach. CAUPD participated in the exhibit and poster design for the new county town's planning exhibition hall. Meanwhile, CAUPD also completed the new county town's urban design layout, and utilized a variety of medium such as rendered maps, models and brochures for public display and exhibition to facilitate broader participation and consensus building.

Figure 6: Spatial structure of Beichuan New Town, CAUPD

3. Implementation Mechanism

The smooth progress of Beichuan's reconstruction benefited from not only the orderly practice of planning and design, but also their effective implementation. The aid receiver (local government), aid sponsor (partnership assigned by the central government) and a third party (technical support) played an important role in coordinating and supervising the reconstruction effort. The third party built the bridge of communication between the aid receiver and aid sponsor. Through coordinating demands, building consensus and providing technical support, CAUPD helped to build an orderly process.

3.1 Multi-party Cooperation Mechanism

In order to push forward an efficient and systematic construction process, the local government established a “three-pillar communication and coordination mechanism". The so-called "three pillars" are the Beichuan County Construction Commanding Headquarter, Shandong-Province Partner Commanding Headquarter, and Commanding Headquarter for New Town Planning. The Beichuan County Construction Commanding Headquarter answers to the municipal committee, municipal government of Mianyang City, and the county committee, county government of Beichuan County. It regulates the Shandong-province partner and planning and design institutes such as CAUPD and is also in charge of the new county town’s construction. The Shandong-Province Partner Commanding Headquarter represents the provincial committee, provincial government of Shandong and coordinates with its 17 municipalities, overseeing the construction projects they sponsored. The Commanding Headquarter for New Town Planning was delegated by both the municipal and county government to lead the master plan, regulatory plan, and sector plans of Beichuan New Town and coordinate with other planning and design institutes for technical support and decision-making consultancy. In addition, the new county town selected Huaxi Corporation through public bidding for the construction projects under their supervision.

A series of work systems was created among the three headquarters to strengthen the coordination and cooperation among them.

(1) Three-pillar joint meeting system: every Wednesday a contact meeting was held to study and solve major issues in construction projects and to establish efficient and direct channels of communication and decision-making mechanisms.

(2) Three-pillar joint inspection system: every Thursday the three commanding headquarters would collectively conduct site inspection on the implementation of planning and design, construction quality, progress and safety.

(3) Construction project review system: from time to time the three headquarters would review the work progress. Competitions were held to encourage better progress, quality and performance as well as identify and solve problems.

3.2 A Single “Funnel” for Filtering Technical Responsibilities

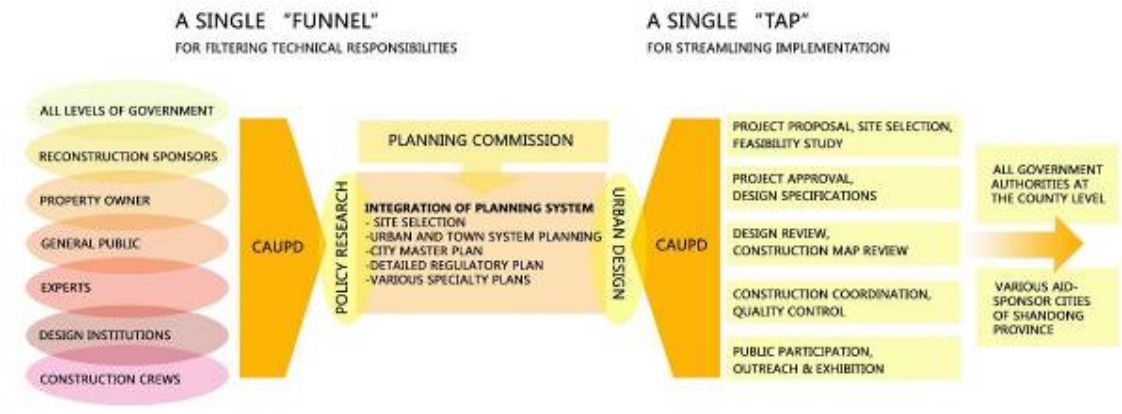

Figure 7: Beichuan New Town implementation mechanism, CAUPD

3.3 The Establishment of Post-quake Planning Committee

Beichuan's local government adhered to a system of proper decision-making of governmental organization, multi-party cooperation and uniformed coordination. This system effectively ensured the full implementation of planning intentions and smooth progress of construction.

(1) Working mechanism of planning committee

To establish a sound decision-making mechanism in Beichuan, the municipal committee, municipal government of Mianyang City, together with the county committee and county government of Beichuan, established the Beichuan Post-quake reconstruction committee with the municipal committee secretary as its director. Members of the committee were formed by officials from municipal agencies, county government, Shandong-province partner and planners from CAUPD. The planning committee was in charge of reviewing all sorts of planning schemes and outcomes. The committee was to fully respect the opinions of experts and collect feedbacks from various parties and governmental agencies. It served a crucial role in realizing Beichuan New Town's effective and efficient planning implementation and decision-making.

(2) Interactive mechanism among all levels of government

Under the instructions of Premier Wen Jiabao, in order to promote the planning and construction of Beichuan New Town, on October 28, 2009, the Ministry of Housing and Urban-Rural Development and the Sichuan Provincial Government jointly held a "Beichuan County Planning and Construction Coordination and Promotion Meeting". The Meeting established an interactive mechanism for all levels of government, from the Ministry, the provincial, the municipal to the county, so that personnel and technical support could be most effectively organized to strengthen guidance on the construction of the new county town.

(3) Expert consultation mechanism

Premier Wen Jiabbao emphasized that Beichuan New Town would be open to public input, and that experts' opinion must be valued to minimize mistakes. With the support of the Ministry of Housing and Urban-Rural Development and Sichuan Provincial Department of Construction, through the coordination of CAUPD, Beichuan County fully utilized outside expertise by inviting domestic experts in planning, architecture, municipal utility, transportation and to participate on many major projects. Six academicians, six national architectural masters, and over 1,000 established experts were involved in the design, consultation and review process for over 300 meetings.

In mere two years, through the diligent work of 50,000 construction workers, with the involvement of 200 tower cranes, more than 200 million brick stones and two million tons of cement, Beichuan New Town emerged. Two years of construction work includes 218 reconstruction projects in the investment amount of 11 billion Yuan. Within five square kilometers of short-term construction land, 715 individual buildings were erected with a total floor space over 1.8 million square meters. 65.3 kilometers of municipal road were built, as well as 54 kilometers of municipal utility lines, and over 78,000 trees were planted (Figure 8,9). The innovation of Beichuan's post-quake reconstruction planning and implementation

transformed the old “plan-led” to a “plan-monitor” approach. Through demand coordination, consensus building, in-situ site work, feedbacks were timely collected and incorporated in the refinement of the plan’s execution. This mechanism was widely recognized by the local and central government, and was subsequently promoted to be applied in other post-disaster reconstruction effort in Yushu, Qinghai, and Zhouqu, Gansu.

Figure 8: Photo of Beichuan New Town center, CAUPD

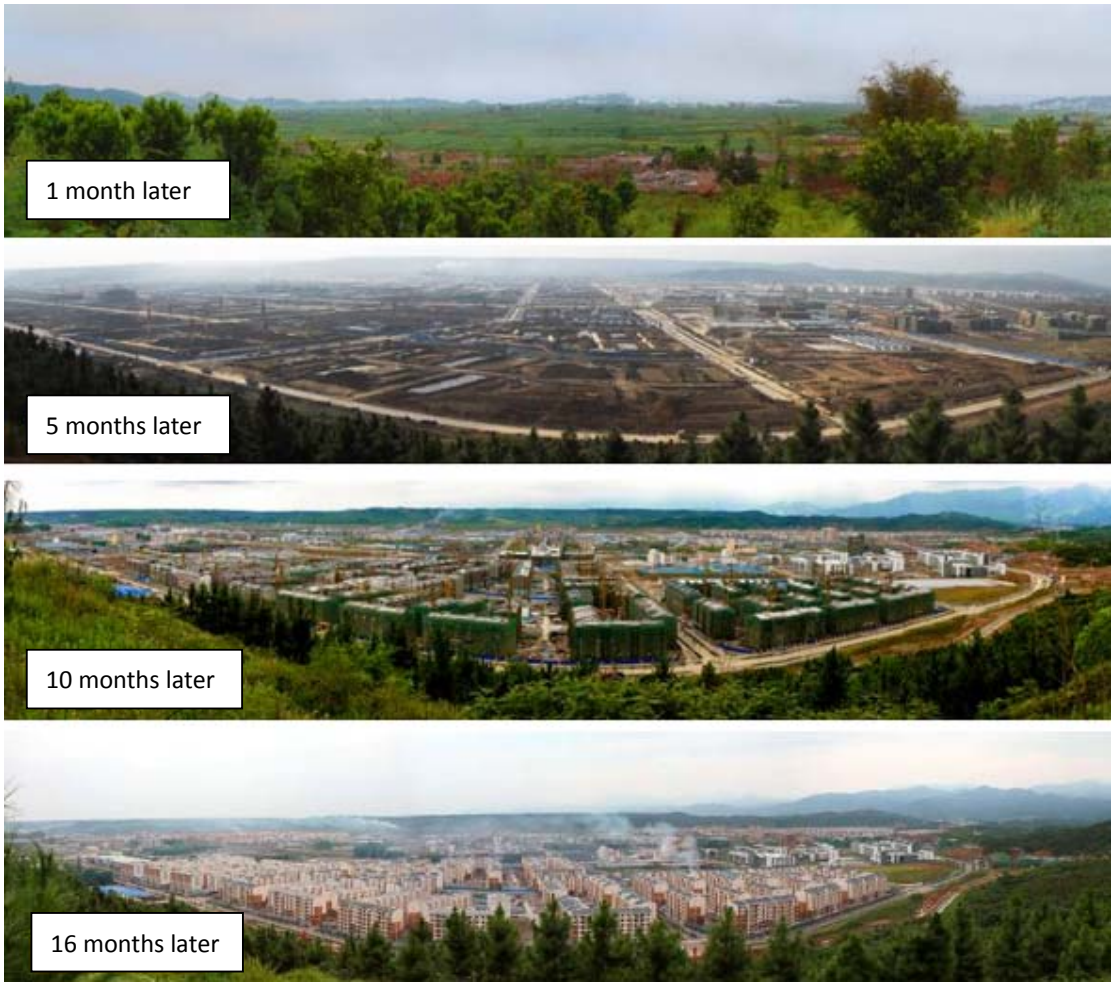

Figure 9: Beichuan New Town construction stages, CAUPD

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