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Economic Cooperation**

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Comparison Study of Post Disaster Recovery - Case Study of Greensburg and Wenchuan

Submitted by: Beijing Normal University



**Seminar on Capacity Building for Disaster
Recovery and Rehabilitation
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Comparison study of post disaster recovery

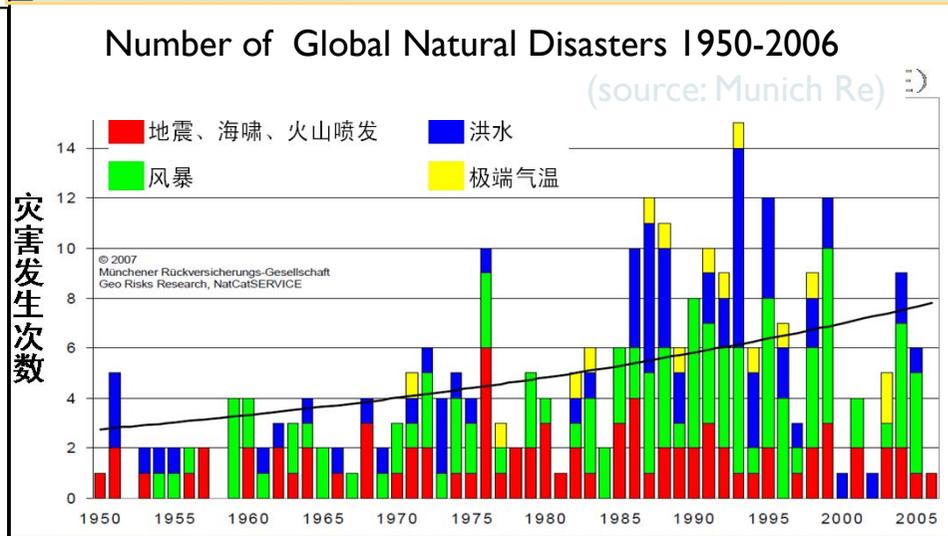
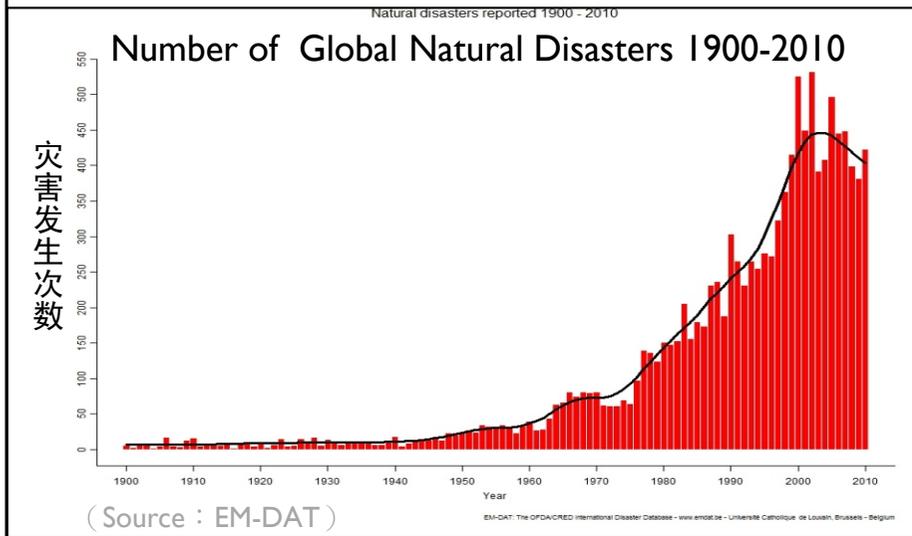
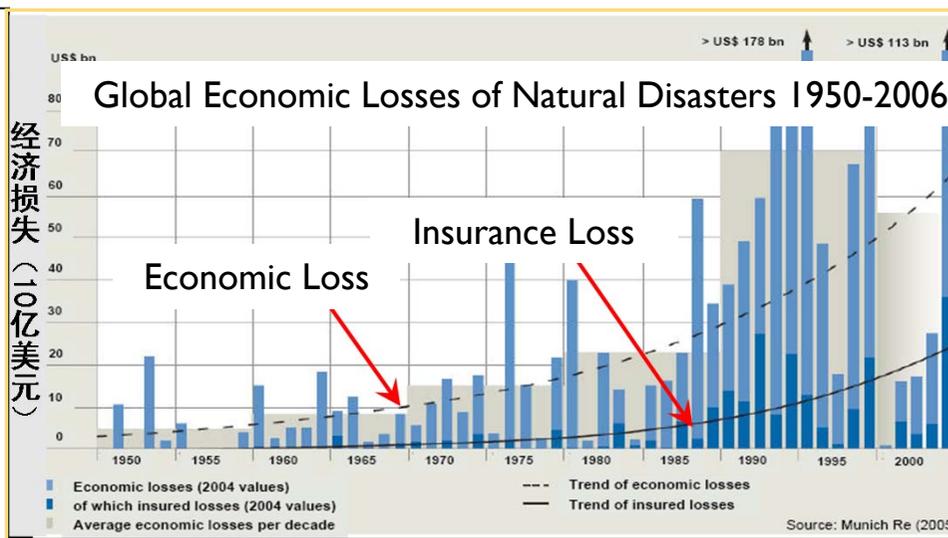
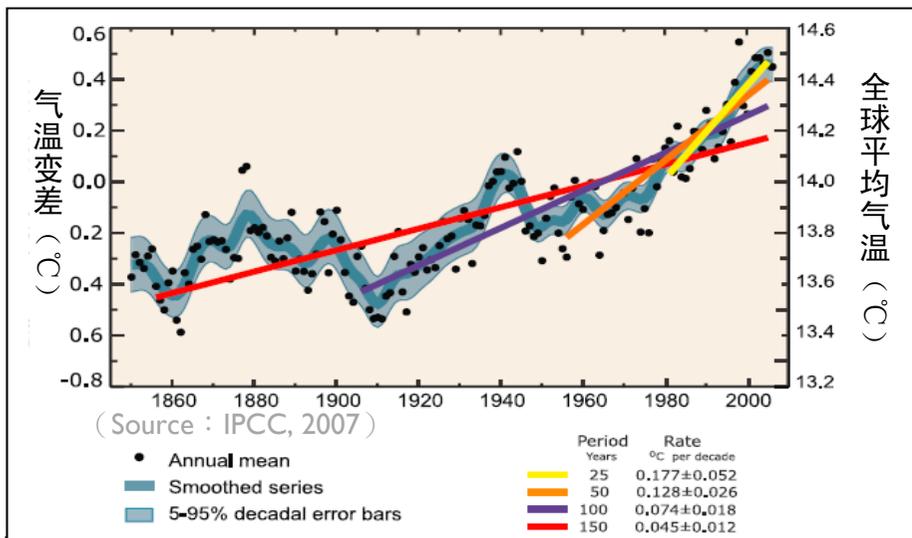
——Case study of Greensburg and Wenchuan

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Content

- 1** Background
- 2** Recovery of Greensburg
- 3** Recovery of Wenchuan
- 4** Comparison and findings

Background



Comparison and Collaborative Study of Integrated Risk Governance Technique and Paradigm for Typical Vulnerable Area

- ▶ Collaborated by Beijing Normal University, IHDP, Nanyang Technological University, University of Colorado
- ▶ Research Content
 - ▶ Early warning (drought)
 - ▶ Capacity building
 - ▶ Recovery process
- ▶ Sponsored by the MOST of China
- ▶ 2012-2014

Contents of Recovery Process

- ▶ Returning vital life-support systems to minimum operating standards
- ▶ Temporary housing
- ▶ Public information
- ▶ Health and safety education
- ▶ Reconstruction
- ▶ Counseling programs
- ▶ Economic impact studies

Literature Review

▶ International

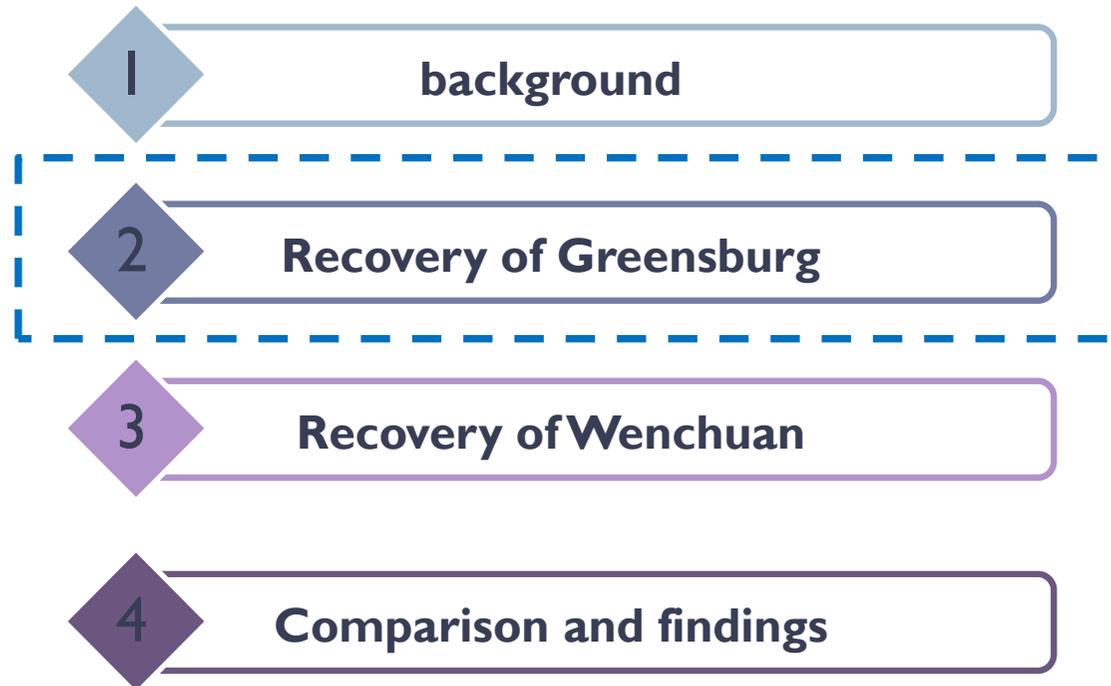
- ▶ Environment governance in sustainable recovery process post disaster (Guarnacci, 2010)
- ▶ Radical project management with limited resources (Brandon, 2011)
- ▶ Recovery mechanism for areas under expectation (Lyon, 2009)
- ▶

▶ Domestic

- ▶ Policy study for central and local government (Lan, 2011)
- ▶ Experience of reconstruction (Shen et al. 2009)
- ▶ Fund-raising (PBC, 2008)
- ▶ Lessons learned from historical disasters and recovery processes (Lan, 2011)
- ▶

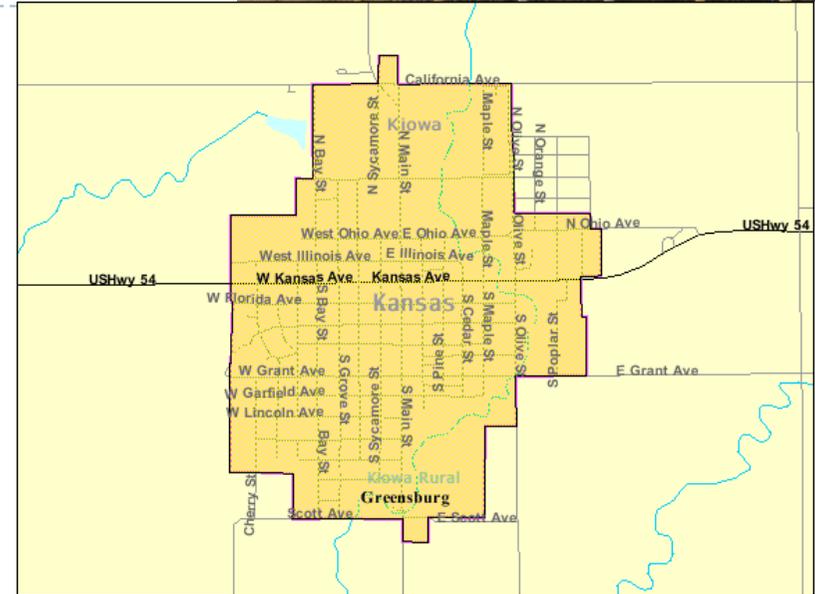
- ▶ Compared to other areas of hazard research , studies on recovery process are limited and unsystematic

Content



Tornado Disaster, Greensburg

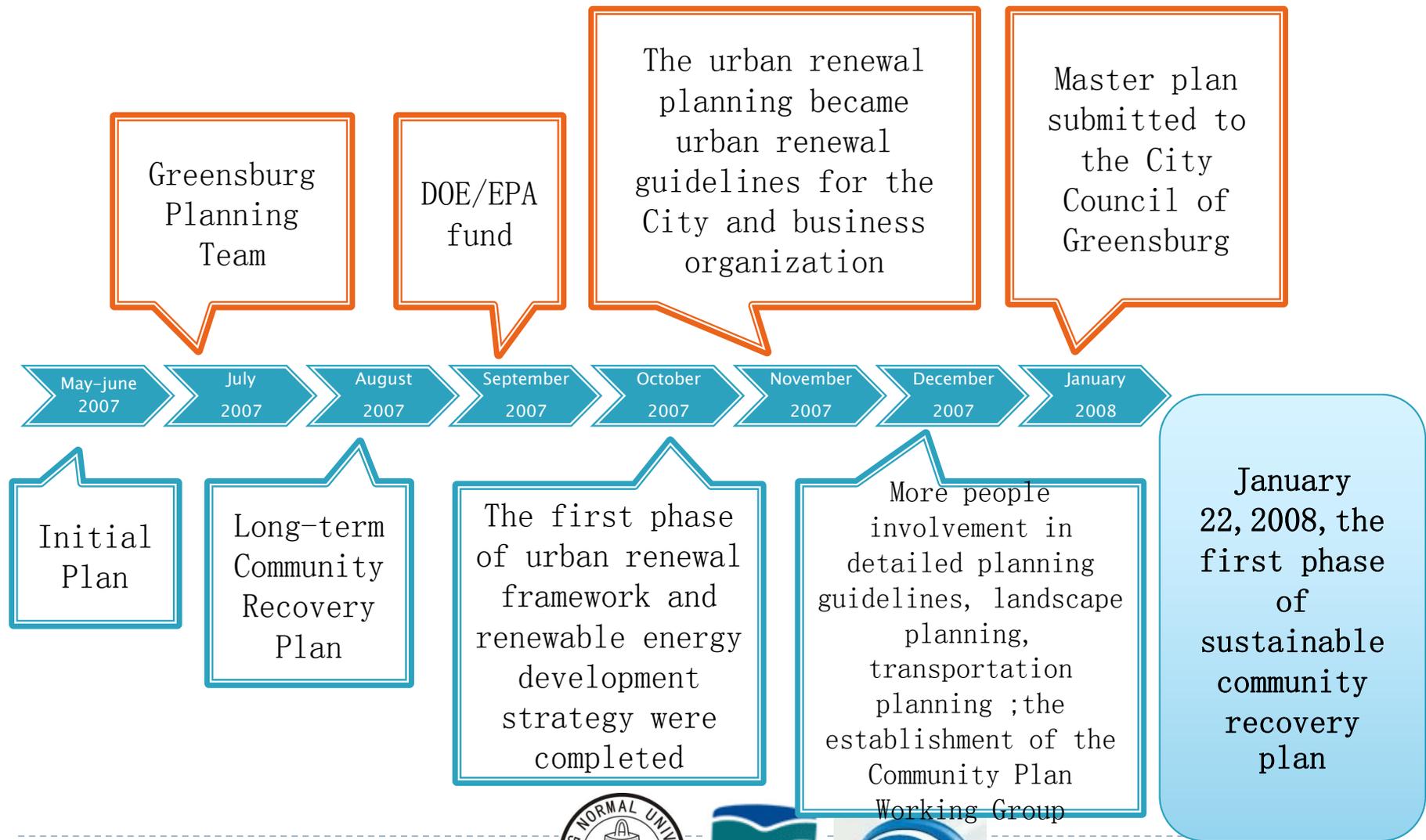
- ▶ **Greensburg** is a city in Kiowa County, Kansas, United States. As of the 2000 census, the city population was about 1500. Greensburg is home to the world's largest hand-dug well.
- ▶ In the evening of May 4, 2007, Greensburg was devastated by an EF5 tornado that traveled rapidly through the area. The National Weather Service estimated winds of the tornado to reach 205 mph (330 km/h).
- ▶ At least 95 percent of the city was demolished and eleven people between the ages of 46 and 84 were killed.



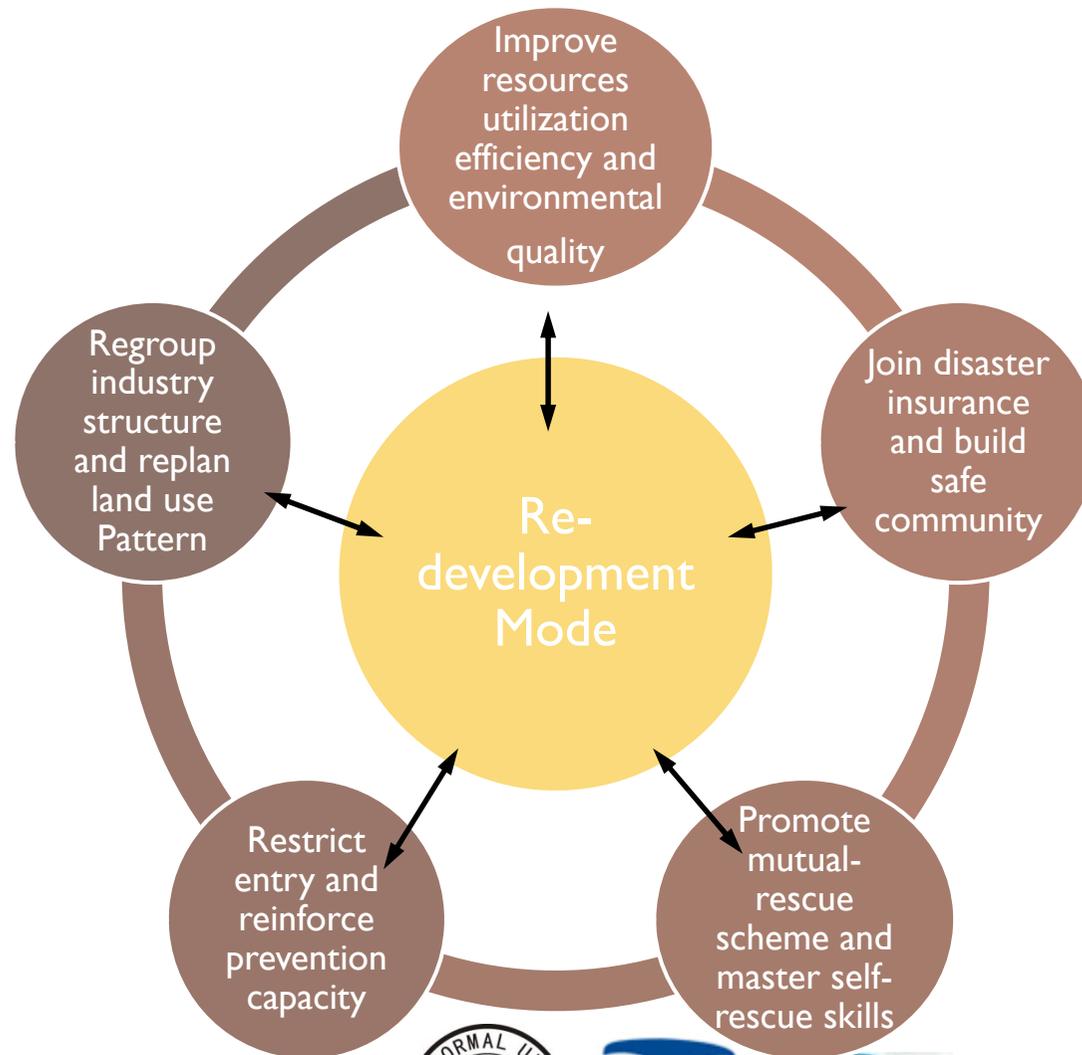
Greensburg, Before and After Disaster



Recovery Planning Procedure



Planning Concept - Disaster Recovery and New Development

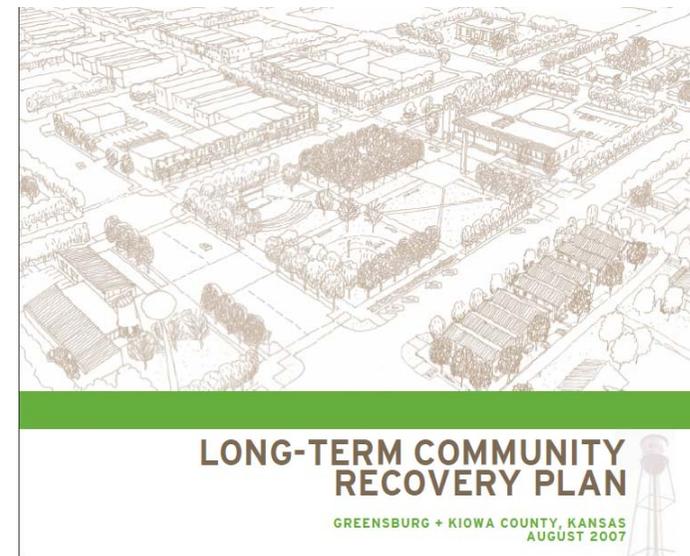


Recovery planning—The first phase of recovery planning

Urban renewal framework for Greensburg under the principle of economic, social, environmental and sustainable development.

Urgent tasks :

- ▶ goals and principles of recovery;
- ▶ conceptual design of central area;
- ▶ optimized design of zoning ,
 infrastructure analysis and land use planning;
- ▶ preliminary housing policy recommendations;
- ▶ guidance of landscape design for major roads;
- ▶ initial energy-saving measures and policies;
- ▶ efficient pedestrian community building strategy;
- ▶ parks and open space layout .



Recovery planning

—Comprehensive Plan of Sustainable Development

The comprehensive plan of sustainable development is more specific and detailed than the that of the first stage, and focuses more on the "green" building concept in Greensburg. Moreover, it has made a great contribution to the forming of the **legal documents for the recovery of Greensburg** .

- ▶ Recovery target
- ▶ The overall introduction about situation of Greensburg
- ▶ Design of the central area
- ▶ Convenient pedestrian traffic system
- ▶ The environmental performance of buildings
- ▶ Disaster prevention and mitigation
- ▶ Economic development
- ▶ Energy use
- ▶ Transportation
- ▶ Carbon emissions
- ▶ Residential construction
- ▶ Public infrastructure
- ▶ Parks and green belt construction
- ▶ Future land use and policy



05.19.08

Public Involvement

- ▶ In order to make sure the recovery projects can be implemented smoothly, the town established a special mechanism to ensure effective public involvement in planning process.



Public Involvement

- ▶ **Planning team leaded by the Public Supervise Committee** : the team gathers a group of people who are familiar with the local situation and can regularly participate in the discussion of the recovery plan.They will discuss with design team about the plan in the early three months, which will provide designers more local opinions.
- ▶ In addition, the design team has regular meetings with **commercial organizations, the city council, local green groups, the planning steering committee** and other stakeholders.

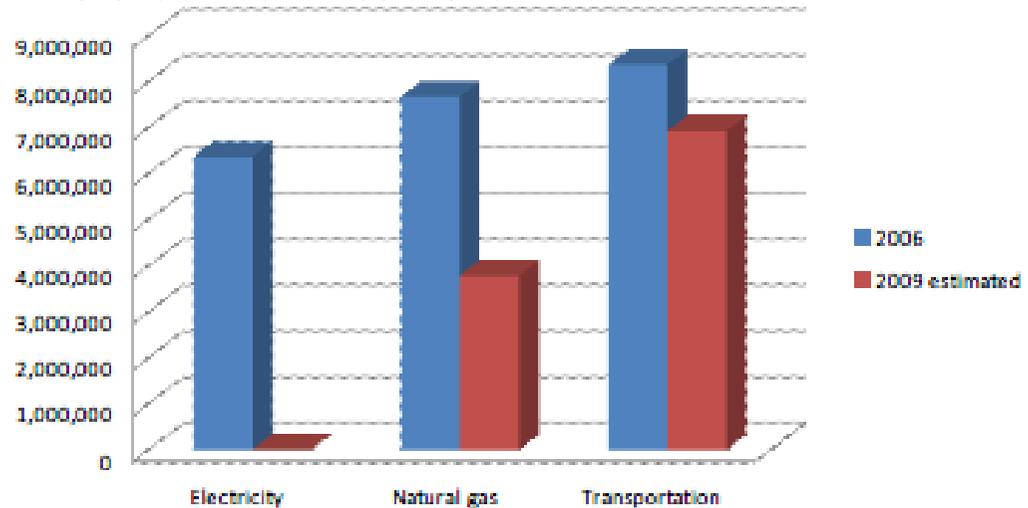


Sustainable Recovery — Carbon Emission

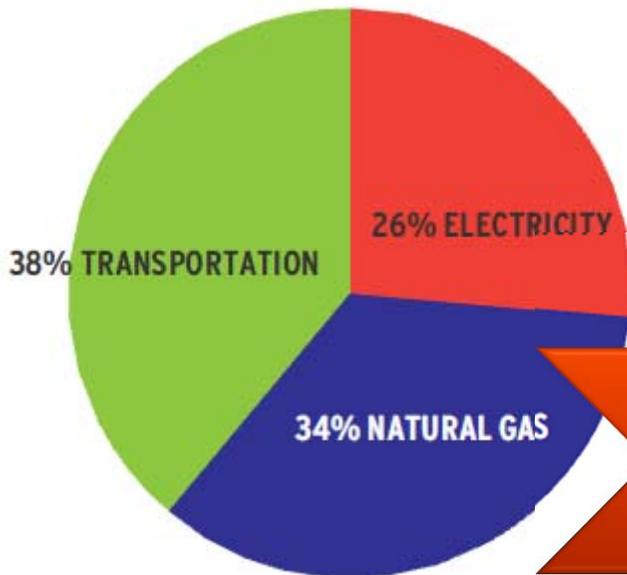
GREENSBURG CARBON EMISSIONS ESTIMATE

2006 GREENSBURG ESTIMATED TOTAL CARBON EMISSIONS

ELECTRICITY	5,827,080 lbs
NATURAL GAS	7,566,000 lbs
TRANSPORTATION	8,360,000 lbs
TOTAL	21,753,080 lbs, OF 10,876.54 TONS OF CO ₂



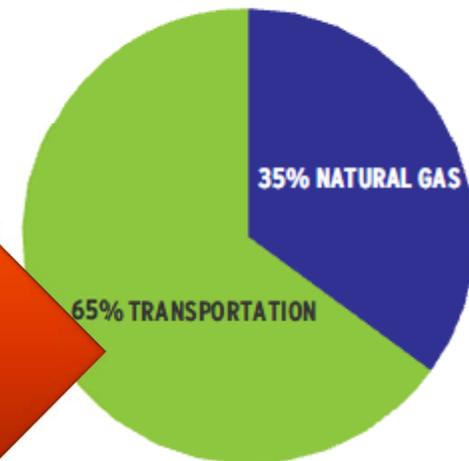
2009 ESTIMATED CO₂ EMISSIONS BREAKDOWN



2009 GREENSBURG ESTIMATED TOTAL CARBON EMISSIONS

ELECTRICITY	0,000,000 lbs
NATURAL GAS	3,783,000 lbs
TRANSPORTATION	6,925,560 lbs
TOTAL	10,708,560 lbs, OF 5354.28 TONS OF CO ₂

2009 ESTIMATED CO₂ EMISSIONS BREAKDOWN



Traditional forms of coal-electricity were totally replaced by renewable energy generation. Encourage the use of mixed fuel-powered cars and walking and bicycle



2012-8-13

Sustainable Recovery —Pedestrian System

▶ Walkable town, residential density

- ▶ In the central area , high-density residential buildings are built with commercial facilities on the first floor. Medium-density settlement patterns are placed close to the central area , while low-density residential or rural residential can be placed in rural areas.



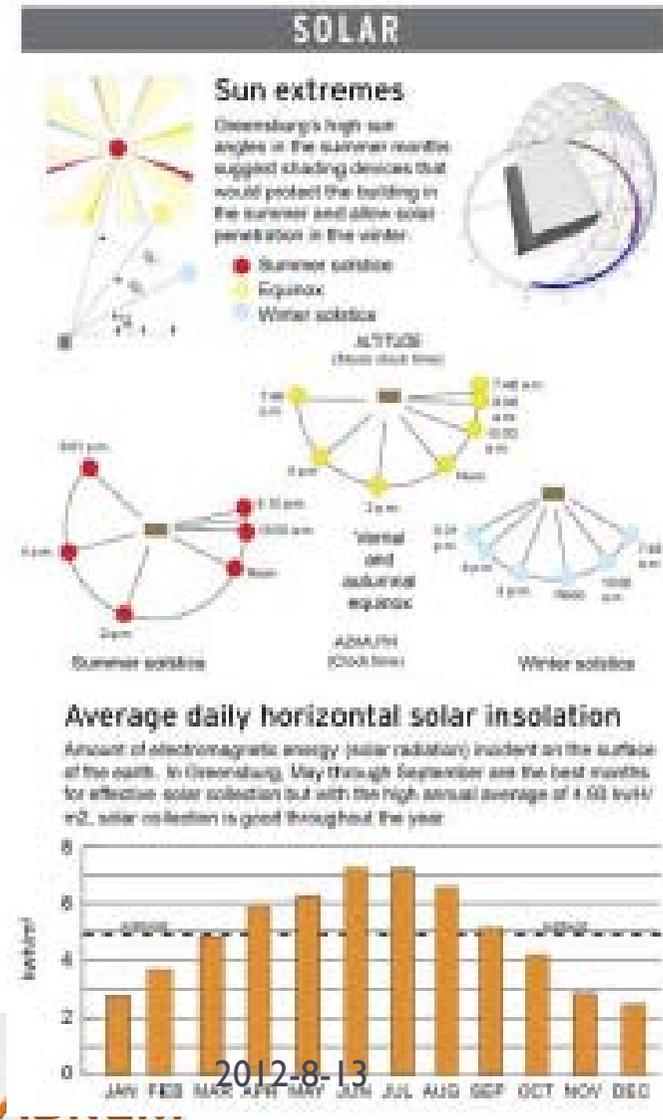
Although Greensburg is a small town, there is still an infrastructure of a subtle transect. Parcels near the Main Street Core are smaller than those on the periphery of town.

Sustainable Reconstruction — Green Building

- ▶ A model city target to achieve:
 - The choice of building materials: Ecological environment friendly
 - Ecological building design: Building materials, land use, green corridors, waste water management system, etc.
 - All buildings meet LEED standards

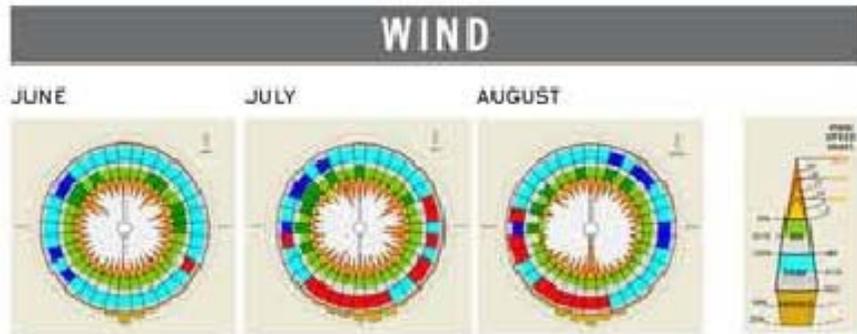
Sustainable Recovery — Solar Energy

- ▶ City hall under construction, with solar board on the roof.



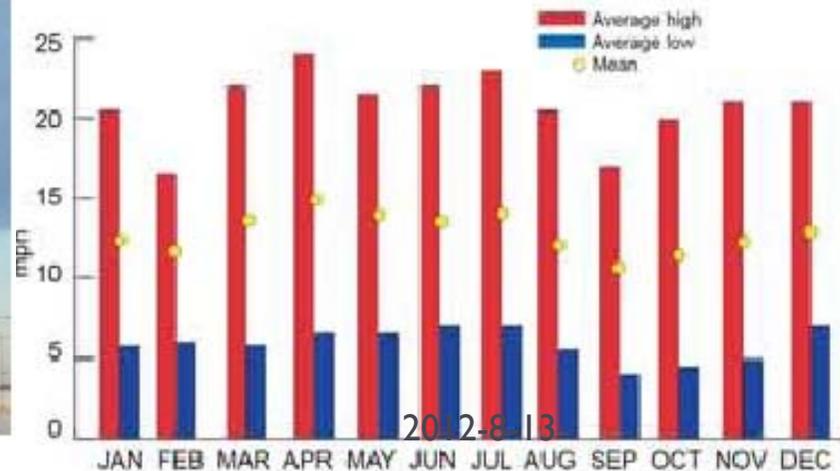
Sustainable Recovery — Wind Energy

- ▶ Greensburg's wind resources can be used for the construction of large-scale wind fields as well as small turbines in the city, which can provide power for the new Greensburg Art Center.



Average wind speed

Greensburg is situated in not only one of the windiest parts of Kansas but of the United States. Wind speed averages remain consistently high throughout the year but spring brings the highest gusts. The summer months of June, July and August, with south winds and comfortable temperatures, offer times when natural ventilation can be used to cool buildings and offer fresh air. Harvesting wind energy is a viable option.



The Success of Greensburg

- ▶ **Each household** : usage of recycled and environmentally friendly building materials, geothermal heating, water-saving toilets, biological detergent and energy efficient light bulbs, minimum use of carpet, and even hybrid cars are quite popular.
- ▶ **New Greensburg** :
 - ▶ Wind Power Towers become the new logo and transform the huge wind power into renewable energy for the town ;
 - ▶ The mesh network of rainwater collection system make it possible to use the rainfall, whose annual level is 550 mm, for irrigation ;
 - ▶ The science fiction like City Hall, completely bathed in natural light ,is under construction . Its giant glass walls maximize the interior lighting and huge solar panels change the original appearance of the building

Economic Benefits

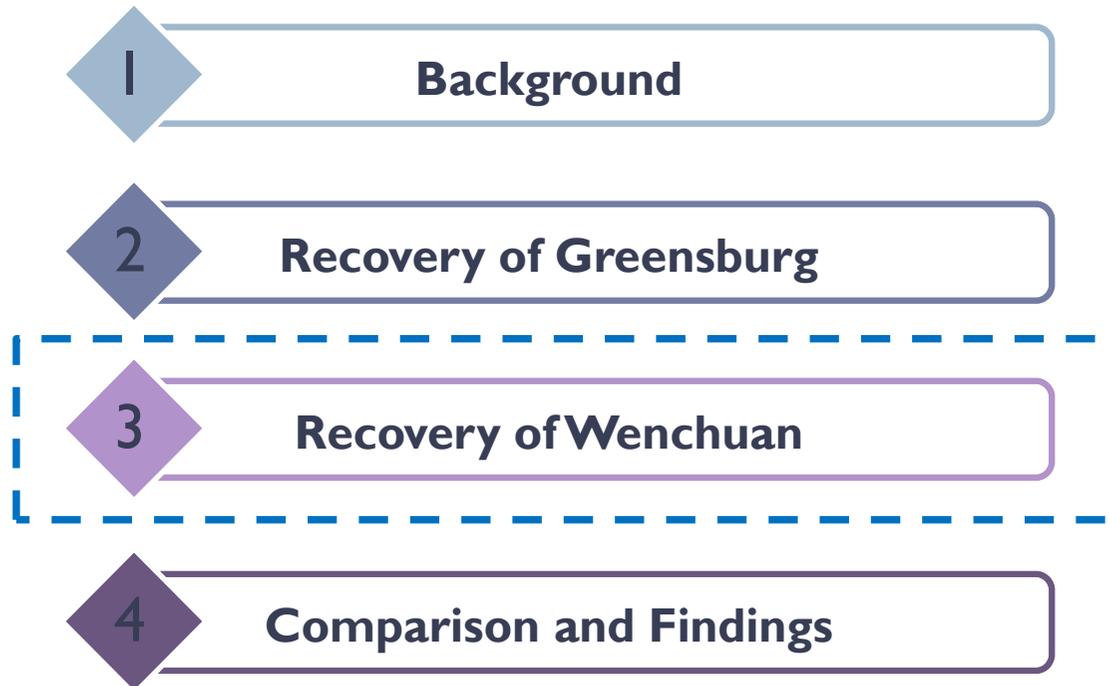
- ▶ **Job opportunities**
 - ▶ Wind farm
 - ▶ Energy sales
- ▶ **Energy cost saving**
 - ▶ Energy cost for business incubator building is less than 50% of a conventional business building
 - ▶ Lighting power density is reduced by 31%.
 - ▶ The geothermal heating system will reduce annual energy costs by more than \$3,500.



Blessed with a unique **opportunity**
To create a **strong community**
Devoted to **family**,
Fostering **business**,
working **together** for future **generations.**



Content



Wenchuan Earthquake

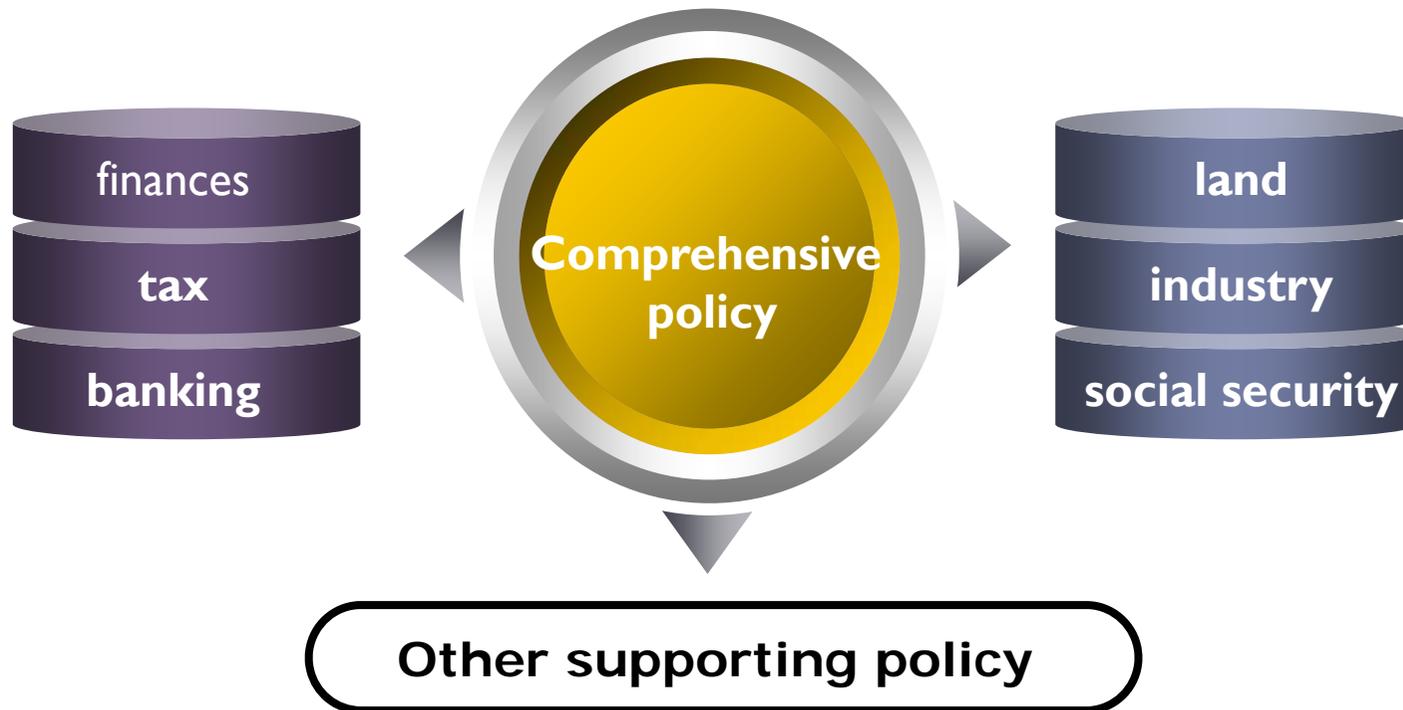
- ▶ Wenchuan earthquake was a deadly earthquake that measured at 8.0 M_s , killing almost 70,000 people, leaving more than 10 million people homeless (Hooker 2008).
- ▶ The area affected by earthquakes exceeding seismic intensity VI totals 440,442 km^2 .

Huge demand for recovery and reconstruction



Policy environment

- ▶ By November 2009, 105 relevant policies were announced by the State and Sichuan Province to support disaster recovery and reconstruction .



Couplet-assistance Policy

- ▶ 19 provinces and cities will provide no less than 1 % of its annual fiscal revenue to its assisted county in Sichuan , Gansu and Shanxi.
- ▶ Encourage industries, communities and private sectors to start business in affected area and encourage financial agencies provide prime lending rate to assisting industries.
- ▶ By 2011, 19 provinces and cities have implemented as many as 4121 couplet-assistance projects and arranged counterparts financial assistance of 84.3 billion RMB.

Progress

●Project finished 17,800, 41.34% of the plan
●Investment:360.0 billion RMB, 36% of the total investment

**Sept.
2009**

●Project finished : 38,800, 94.34% of the plan
●Investment: 885.153 billion RMB, 92.37% of the total investment.

**Jan.
2010**

**April
2011**

●Project finished 21,900, 73.88% of the plan
●Investment: 614.58 billion RMB, 65.48% of the total investment

Experience and Lessons Learned

- ▶ Institutional strengths of China
 - ▶ Centralized power;
 - ▶ The whole country contributes to the earthquake recovery.
- ▶ Effectively promote the assistance
 - ▶ Zhejiang Province- Qingchuan County
 - ▶ **Infrastructure reconstruction**
 - ▶ **Business redevelopment and sustainable development**
 - Vegetable cultivation greenhouses; Angora rabbit breeding; Ecological Agriculture...
 - One town- One industry

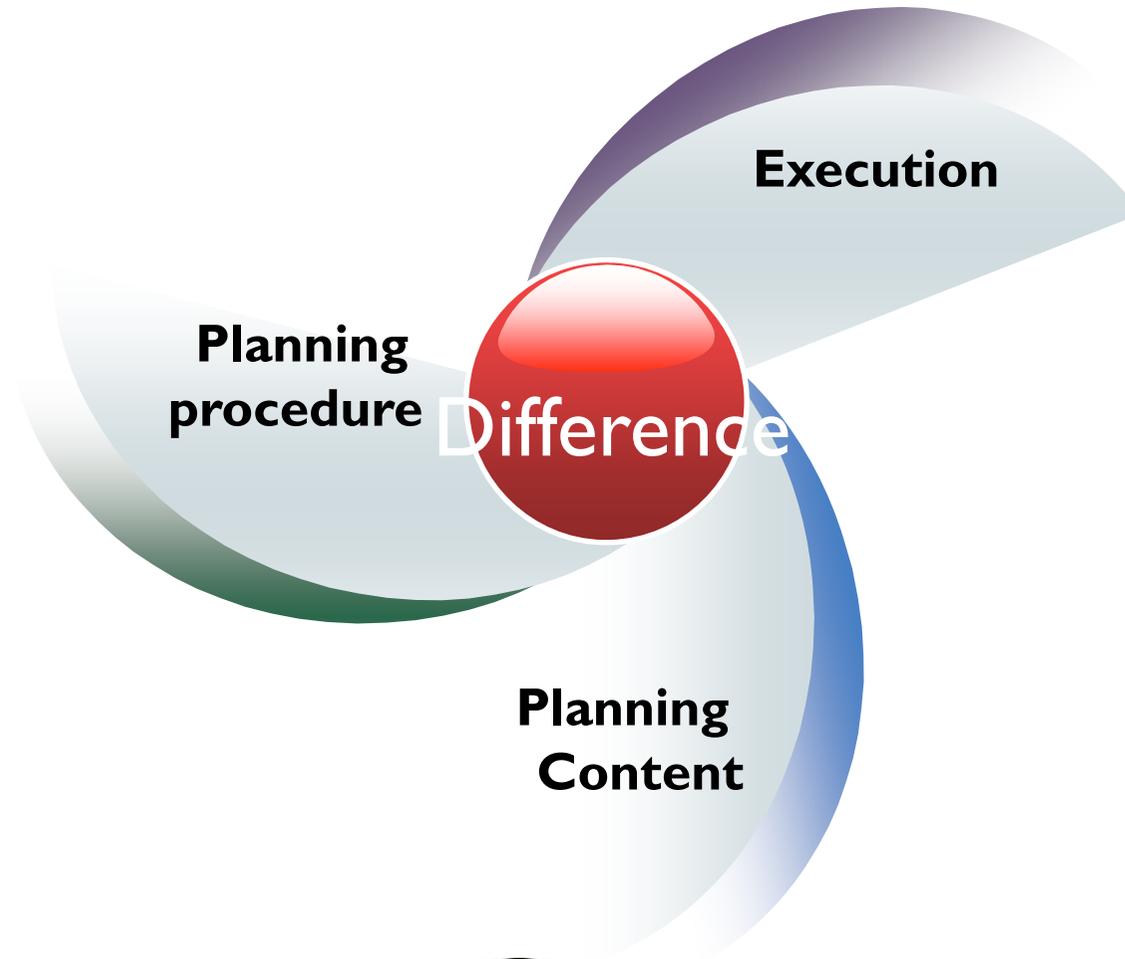
Experience and Lessons Learned

- ▶ Legal support for post-disaster recovery
 - ▶ Wenchuan earthquake restoration and reconstruction ordinance
- ▶ Make the post-disaster recovery and reconstruction planning scientifically
 - ▶ Post-disaster recovery planning group
- ▶ Policy support for disaster recovery and reconstruction
 - ▶ Relevant policies by the State Council
 - ▶ Relevant policies by the provincial government of the affected areas
- ▶ Take disaster recovery and reconstruction as an important measure to expand domestic demand
- ▶ Take the recovery work as an important means to cultivate and assess cadres

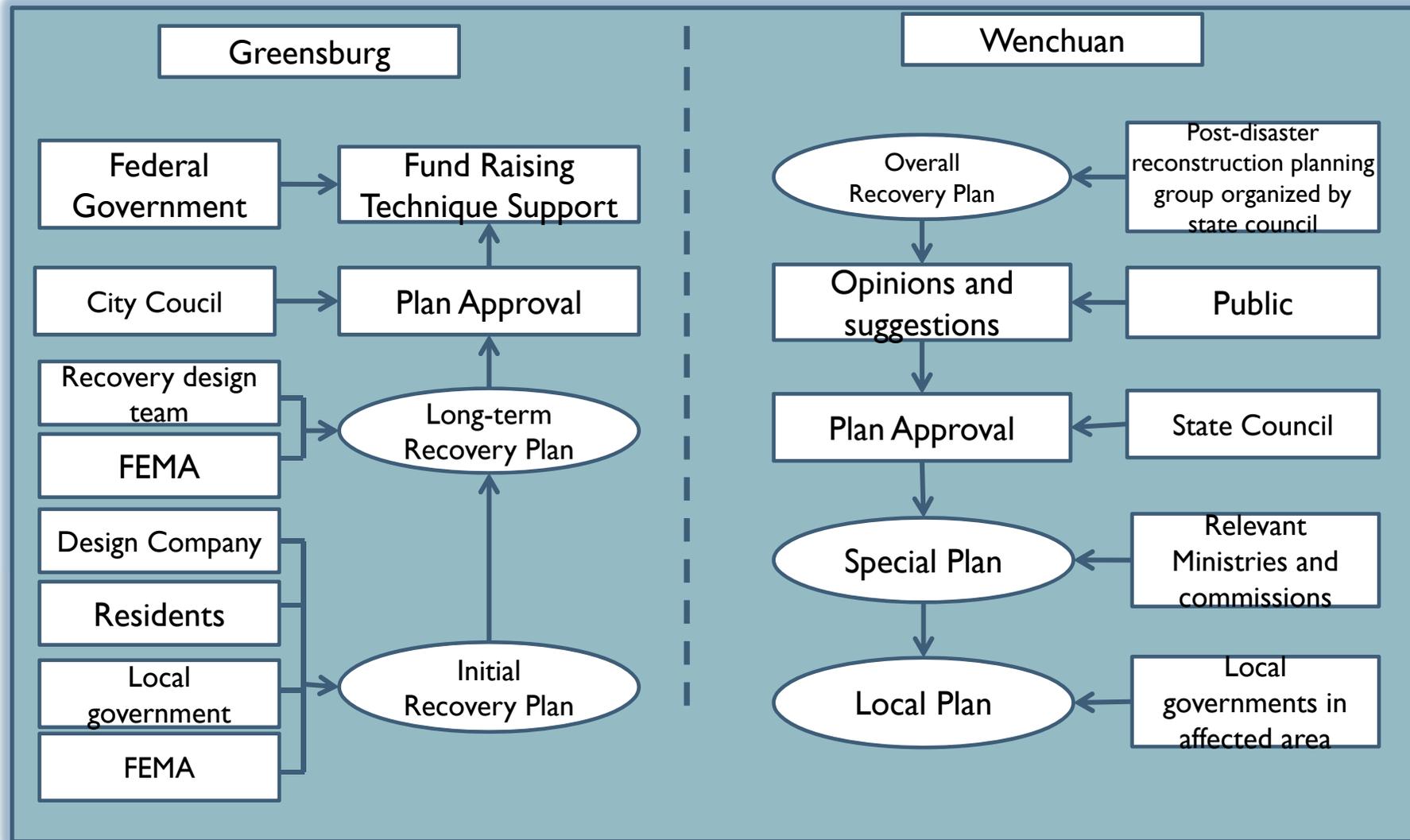
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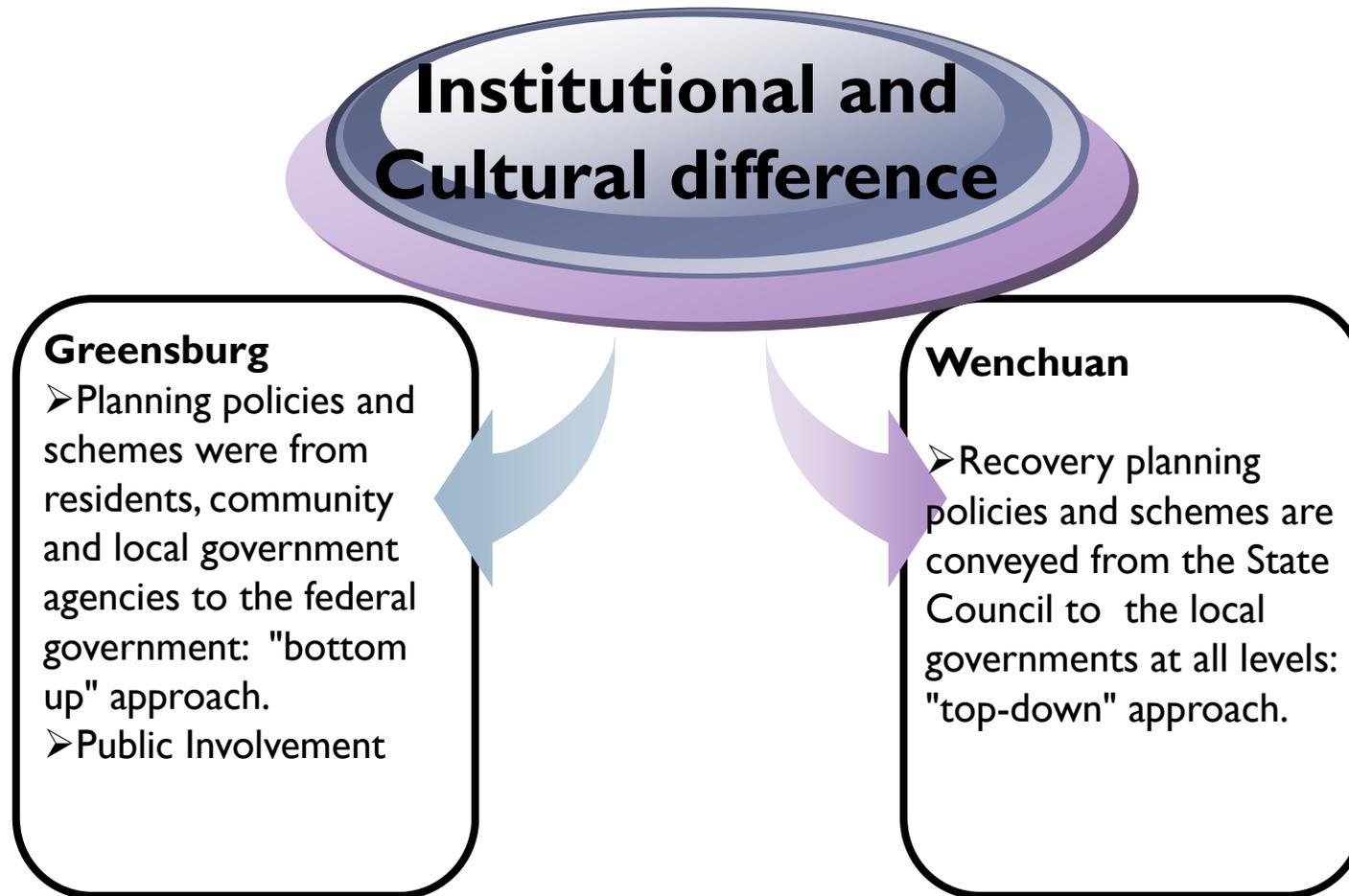
Comparison



Planning Process



Procedure



Contents

Greensburg

Start from details and categorized and organized at each level, to achieve the target of “Green, Energy Saving, Sustainable Development”

Categorized projects into 3 levels by “Recovery Value”,

Prioritize in implementation;

Detailed instruction for preparedness, execution plan and budget.

Wenchuan

Leaded by the overall plan published by the State Council, implemented by local government agencies.

Overall Plan—— a whole picture, guidelines

Special Plan ——details in specific area

Local Plan ——more details, executable

Execution

Greensburg

- Multilateral cooperation mechanisms
- Effectively integrate government agencies, communities and NGOs. Especially, intensive public involvement is the crucial for its recovery process.

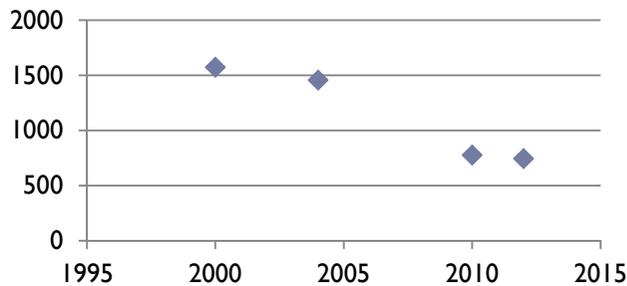
Wenchuan

- Couplet-assistance policy
- Effectively solve the needs for labor, money, resources for recovery, and save administrative cost. Greatly expedite the recovery process.

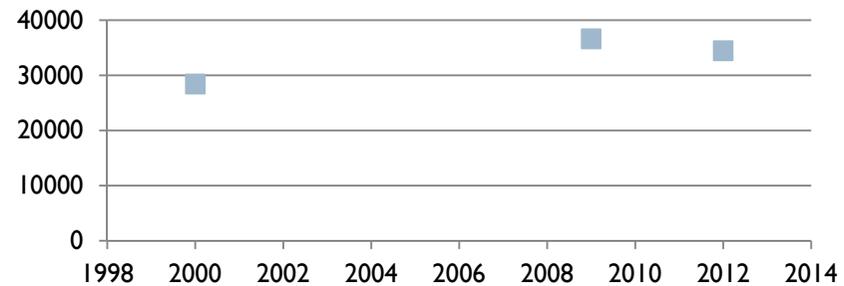
Future Study

- ▶ Cost-Efficiency ?
- ▶ Cost-Benefit ?
- ▶ Short-term, mid-term, long-term impact?

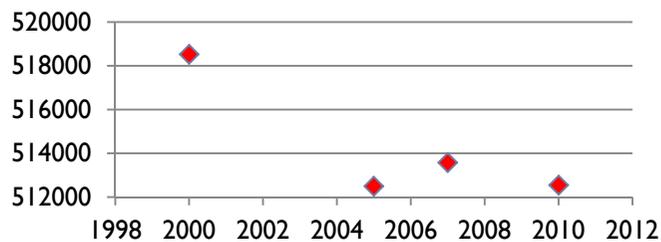
Population



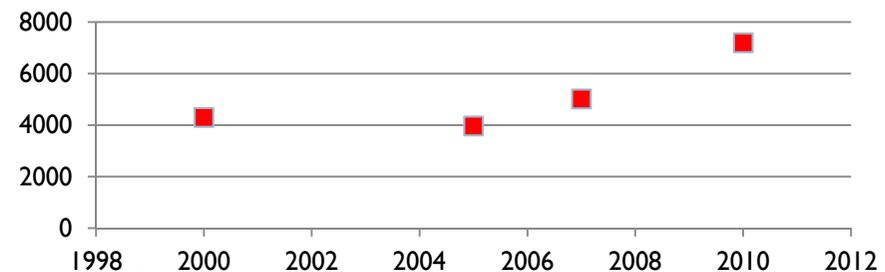
Median household income



Population



Personal annual income



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13. 灾后规划重建组. 国家汶川地震灾后恢复重建总体规划（公开征求意见稿）. 2008,8,12.



Thank you !

Questions?