Polycentric Governance of Crisis from the Perspective of Information Economics

An Empirical Study of Wenchuan Earthquake

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1. Puzzle and Dilemma
2. Economic Analysis
3. Questionnaire Survey and Case Study
4. Conclusion and Suggestion
A Brief Introduction of Wenchuan Earthquake

At 14:28, May 12th, 2008, a magnitude 8 earthquake took place in Wenchuan, Sichuan province.

Loss: Earthquake hit about 50 square kilometers of four hundred and seventeen counties in five provinces and cities in China. According to the ministry of civil affairs website, Wenchuan Earthquake had caused a direct economic loss of 845.1 billion RMB. By September 25th, 2008, Sichuan Wenchuan Earthquake had been confirmed that 69,227 people were killed and 374,643 injured, 17,923 missing.

Rescue: According to the ministry of civil affairs, by the end of September 25th, 2008, the country had received donated goods and funds of life necessities worth 37.222 billion RMB, and a total of 1.5797 million tents, 4.146 million tons of fuel oil, 8.858 million tons of coal. By February 28th, 2009, the social donation amount reached 76.022 billion RMB, more than 3 millions of volunteers went to the disaster area to participate in rescue.
1. Puzzle and Dilemma

Puzzle: Information Concentration VS. Information isolated Islands

Result: Resources Concentration VS. Resources Island

Two Dimensions of Information Concentration:
- Space Concentration
- Time Concentration

- Wenchuan
- Beichuan
- Qingchuan
- Shifang
- Mianzhu
- Baoxing
- Lushan
Catastrophe will make the social situation into a temporary disorder, and the demands for public resources in the disaster area will be urgent.

We will discuss different stages of the disaster and the characteristics of the law of public resources demands.

Three stages of the catastrophe response

1. the stage of emergency rescue;
2. the stage of transitional resettlement;
3. the stage of reconstruction;

### Wenchuan Earthquake (2008)

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 12th ~ May 19th</td>
<td>the stage of emergency rescue</td>
</tr>
<tr>
<td>May 20th ~ September 4th</td>
<td>the stage of transitional resettlement</td>
</tr>
<tr>
<td>September 5th, 2008 ~ 2011</td>
<td>the stage reconstruction</td>
</tr>
</tbody>
</table>
2.1 Economic Analysis: The analysis of public resources demands under the catastrophe (cont')

The analysis of catastrophe response to the material demands of the various stages.

<table>
<thead>
<tr>
<th>Various Stage</th>
<th>Description of The Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The stage of emergency rescue</strong></td>
<td>Life rescue, human and material resources are urgently needed</td>
</tr>
<tr>
<td><strong>The stage of transitional resettlement</strong></td>
<td>Demands for life maintenance and psychological support increasingly become the main aspect</td>
</tr>
<tr>
<td><strong>The stage of reconstruction</strong></td>
<td>Mainly focuses on the psychological rescue, and restore the quality of life and livelihood development</td>
</tr>
</tbody>
</table>
2.1 Economic Analysis: The analysis of public resources demands under the catastrophe (cont')

- Material demands in different stages

![Diagram showing material demands in different stages]

- Emergency materials
- Transition materials
- Reconstruction materials

Stage of emergency rescue | Stage of transitional settlement | Stage of reconstruction
2.1 Economic Analysis: The analysis of public resources demands under the catastrophe (cont')

- Volunteers demand in different stages

![Diagram showing the demand of nonprofessional and professional volunteers in different stages of emergency rescue, transitional settlement, and reconstruction.](image-url)
### 2.2 Economic Analysis: Analysis on the supply of charity resources under the catastrophe

- **The analysis of the supply of public resources under the catastrophe.**

<table>
<thead>
<tr>
<th>Various Stage</th>
<th>Description of The Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The stage of emergency rescue</em></td>
<td>When the people are aware of the seriousness of the disaster, they will be voluntary to lend a helping hand</td>
</tr>
<tr>
<td><em>The stage of transitional resettlement</em></td>
<td>Non-professional volunteers appear to be a surplus, but transitional materials are relatively scarce, and donations will reach a peak during this period, and then slowly decrease</td>
</tr>
<tr>
<td><em>The stage of reconstruction</em></td>
<td>Public supply will encounter a rapid decline, the market mechanism is restored and basic construction materials can be accessed through the market</td>
</tr>
</tbody>
</table>
2.2 Economic Analysis: Analysis on the supply of charity resources under the catastrophe (cont’)

The analysis of donations in different stages during the catastrophe

Donations basically show a rapidly increasing at the beginning and then slowly decreasing afterwards.

Experience Learning of Taiwan 9.21 Earthquake:
To launched a reconstruction Fund from 1999 to 2008.
2.2 Economic Analysis: Analysis on the supply of charity resources under the catastrophe (cont)

- Volunteer service supply in different stages

![Graph showing the supply of volunteer services in different stages](image)
2.3 Economic Analysis: The contradiction between supply and demand of public resources during the catastrophe

1. The asymmetric information as well as the blindness and disorder of rescue during the catastrophe
   - It is unable to know the comprehensive stricken situations in time, and charity resources cannot be effectively allocated

2. Supply and demand of commonweal rescue resources are inconsistent
   - Especially in microcosmic individual level, due to the fact that each individual's condition is different, the rescue is faced with various personalized demands

3. The commonweal rescue supply in a catastrophe is lagged
   - The infrastructures like communication and transportation are enormously damaged and the channels of information and resources get blocked in the catastrophe

4. The supply and demand of public rescue resources are unbalanced
   - It is an important question on how to realize the match between the overall supply and demand
3. Case Study and Questionnaire Survey

<table>
<thead>
<tr>
<th>Main function</th>
<th>Participants Basis for cooperation</th>
<th>Existence time</th>
<th>Changing state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Rescue Center</td>
<td>GONGO + grassroots NGO with a legal status + grassroots NGO without legal status + INGO</td>
<td>Including all the relief phases and is still in operation</td>
<td>Going to apply for an independent legal status</td>
</tr>
<tr>
<td>Integrate information of supply and demand</td>
<td>Members from all over the country and know less of each other</td>
<td>Administered for 17 days</td>
<td>Members prepare to regroup and participate in the post-disaster reconstruction</td>
</tr>
<tr>
<td>NGO relief joint office in Sichuan Province</td>
<td>GATHER, TRANSFER and distribute goods grassroots NGO with a legal status + grassroots NGO without legal status</td>
<td>Transferred from the edge of the system to the system</td>
<td></td>
</tr>
<tr>
<td>Zun Dao Volunteer Coordination Office</td>
<td>Government + enterprise + GONGO + grassroots NGO + individual volunteers</td>
<td>Focus on real demand in the disaster areas, integrate volunteer and social resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Members are not familiar with each other although work in the same place before</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3. Questionnaire Survey and Case Study

#### Overall situation of NGOs in Sichuan Province （officially registered by 2009）

<table>
<thead>
<tr>
<th>Type of NGO</th>
<th>Administrative Level of Registration</th>
<th>Provincial Level</th>
<th>Municipal Level</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Society Groups</td>
<td></td>
<td>1, 034</td>
<td>14, 791</td>
<td>15, 825</td>
</tr>
<tr>
<td>Private Non-enterprise Entities</td>
<td></td>
<td>448</td>
<td>11, 811</td>
<td>12, 259</td>
</tr>
<tr>
<td>Public Funds</td>
<td></td>
<td>38</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>Private Funds</td>
<td></td>
<td>12</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Total Amount</td>
<td></td>
<td>1, 532</td>
<td>26, 602</td>
<td>28, 134</td>
</tr>
</tbody>
</table>
3.1 Questionnaire Survey

We adopt the method of equidistant sampling randomly to select 800 social organizations out of 28,134 ones registered in Department of Civil Affairs of Sichuan Province to carry out the investigation. Since there are only 50 foundations in Sichuan, we sampled all the foundations.

<table>
<thead>
<tr>
<th>Type of NGO</th>
<th>Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provincial Level</td>
</tr>
<tr>
<td>Society Groups</td>
<td>100</td>
</tr>
<tr>
<td>Private Non-enterprise Entities</td>
<td>50</td>
</tr>
<tr>
<td>Public Funds</td>
<td>38</td>
</tr>
<tr>
<td>Private Funds</td>
<td>12</td>
</tr>
<tr>
<td>Total Amount</td>
<td>200</td>
</tr>
</tbody>
</table>
How many NGOs were involved with the rescue

- Involved: 369, 77%
- Not involved: 112, 23%
What NGOs can supply

- Providing relief goods, 189
- Raising funds for disaster relief, 222
- Providing information, 131
- Providing shelter, 50
- Disaster relief training, 55
- Participate in house maintenance and reconstruction, 61
- Investigation of disaster relief demand, 66
- Rescue the wounded, 66
- Volunteer organization, 104
- Emotional and psychological aid, 109
- Cleaning up the disaster scene, 33
- Others, 34
What NGOs want

- Information sharing, 183
- Concerted action, 180
- Comparative advantage, 170
- Enhancing the legitimacy of the organization, 112
- Enhancing the credibility of the organization, 145
- Expanding overall ability and influence, 164
- Enlarging the organization ability and influence, 156
- Others, 1
4.1 Conclusion

- The catastrophe rescue is strictly restrained by time. Thus there always appears the dilemma of information concentration and information isolated islands.
- Therefore, in case of catastrophe, cooperation among all actors becomes so important.
- The ideal situation is that actors cooperate seamlessly with each other.
- The seamless cooperation requires for strict conditions. It needs a unified acting platform, where all actors could share their resources and information with each other.
- Thus, it requires for sufficient rationality, sufficient information and sufficient resources. While in reality, these conditions are difficult to be fulfilled.

Cooperation, like polycentric governance, can cut the cost by sharing information and other resources with each other.
4.2 Suggestion

Two key factors of achieving the timely response to the demands.

- **Smooth channel of information**
  - The public demands can be reflected to the society timely and accurately

- **Smooth channel of resource**
  - The public supplies be delivered to the disaster areas accurately and timely
4.2 Suggestion

An important way to achieve the smoothness of information channels and resource channels under the condition of catastrophes is to construct a platform for information communication and resource allocation coordinated with actions.

Relationship between public demand and supply
4.2 Suggestion

Cooperation between Government, NGOs, and Firms
From information failure to polycentric governance

Information failure in space dimension
From information failure to polycentric governance

Information failure in time dimension

Diagram showing the relationship between demand and supply over time.
Types of Cooperative Platform

- Forums
- Clubs
- Projects
- Contracts
- Networks

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Now let’s summarize our research routine:

catastrophe  information failure  mechanism: polycentric governance
Thank you!