



Long-term Disaster Recovery Processes: Lessons Learned From The 1995 Kobe Earthquake

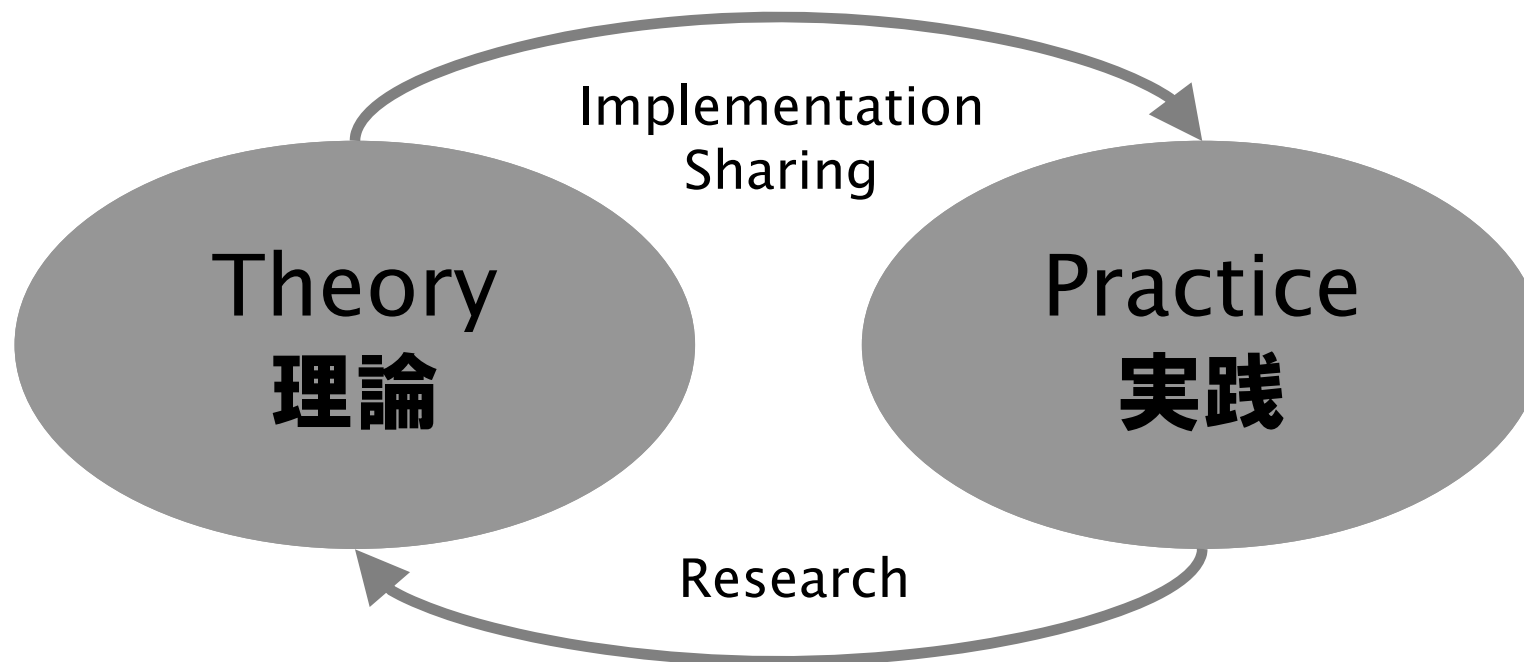
Haruo Hayashi
Kyoto University



Action Research

There is nothing more practical
than a good theory K. Lewin

過去の知見と新しい技術を、現地の対応支援に生かす

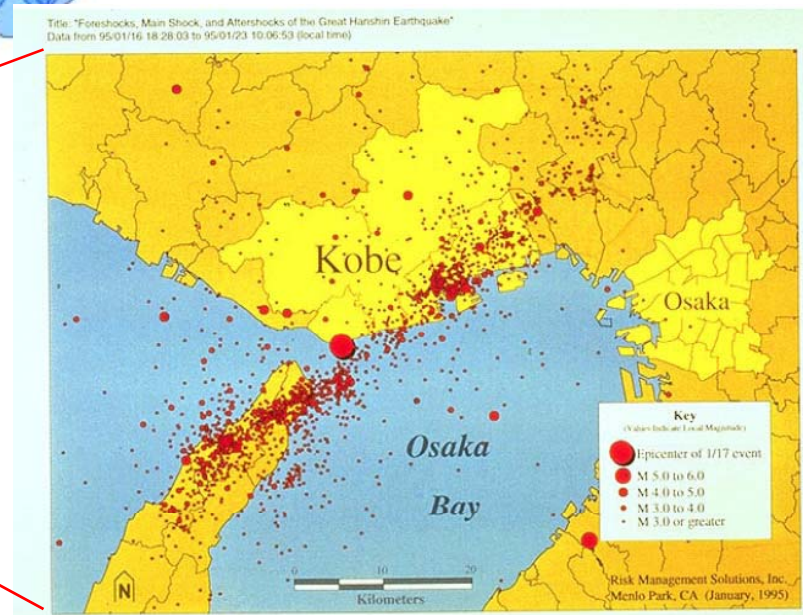


現場活動を通して、新しい問題を発見し、解決法を研究する



Where is Kobe?

M6.9 Kobe Earthquake January 17, 1995



出典: 日本地震活動<追補版>に加筆



First Ten Seconds





Disaster Impacts of Kobe Earthquake (1995.1.17)

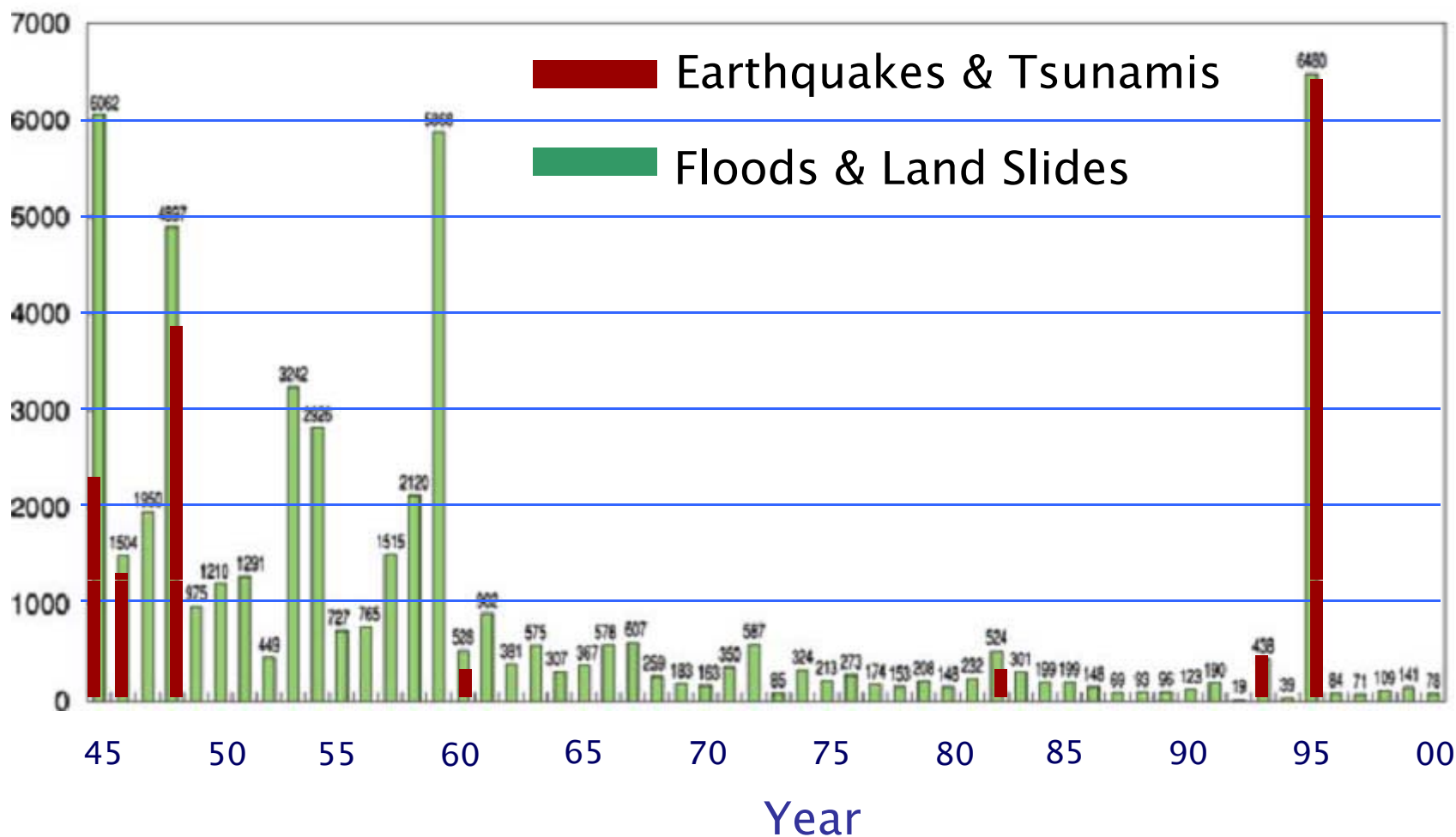
- 
- Dead 6,433
 - Injured 40,071
 - Damages Housing Units 444,900
 - Shelters 1,153
 - Homeless 316,678





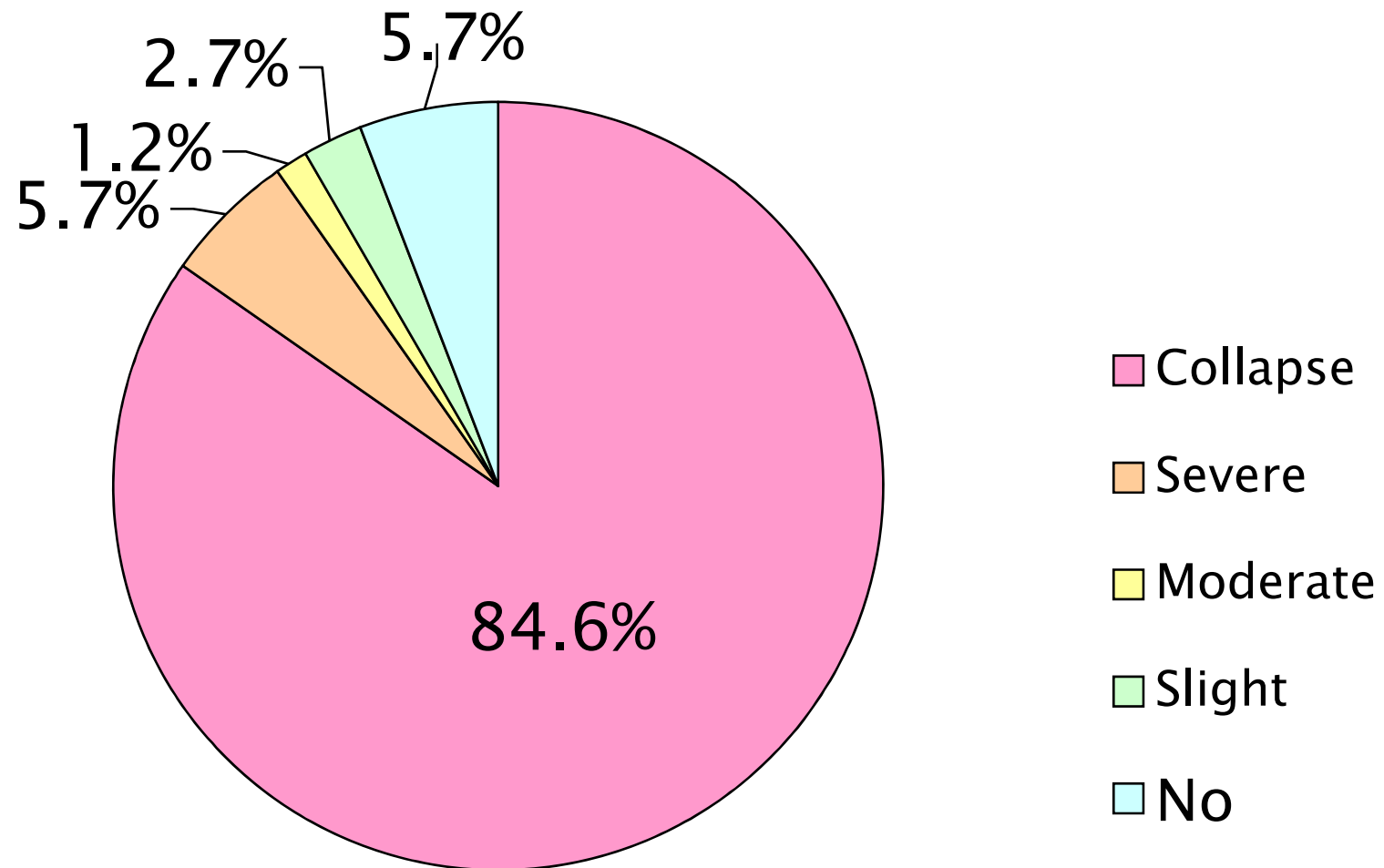
Japanese Disasters by Mortalities

Mortality





Majority of People Were Killed Because of Housing Collapses






What is meant by Collapsed Housings





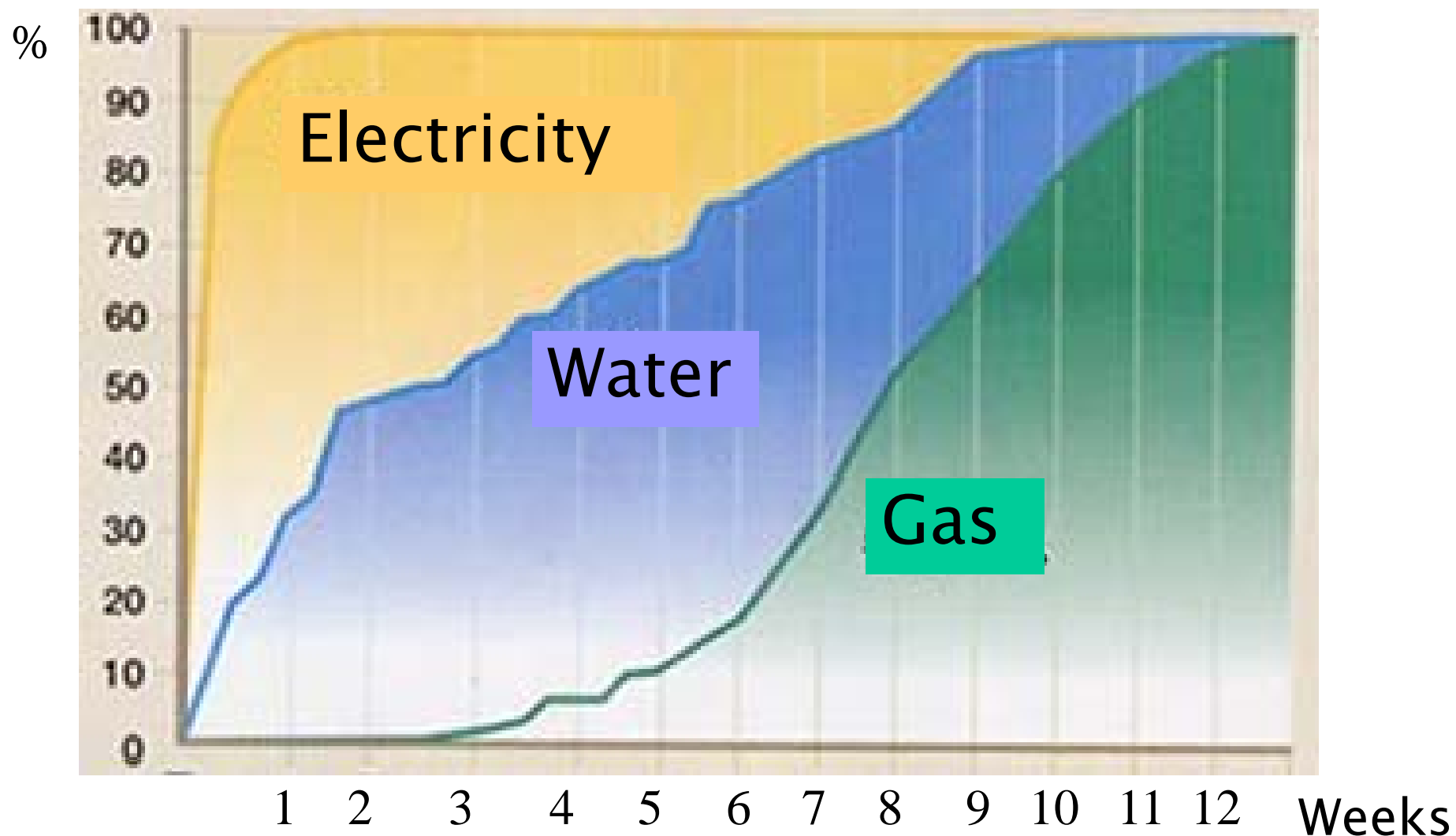
Severe Damage for Lifeline Systems



	Damage	Recovery in
Power	2,600,000	9 days
Gas	850,000	3 months
Water	1,300,000	1 month
Swage	260 km	3 months
Phone	193,000	2 weeks

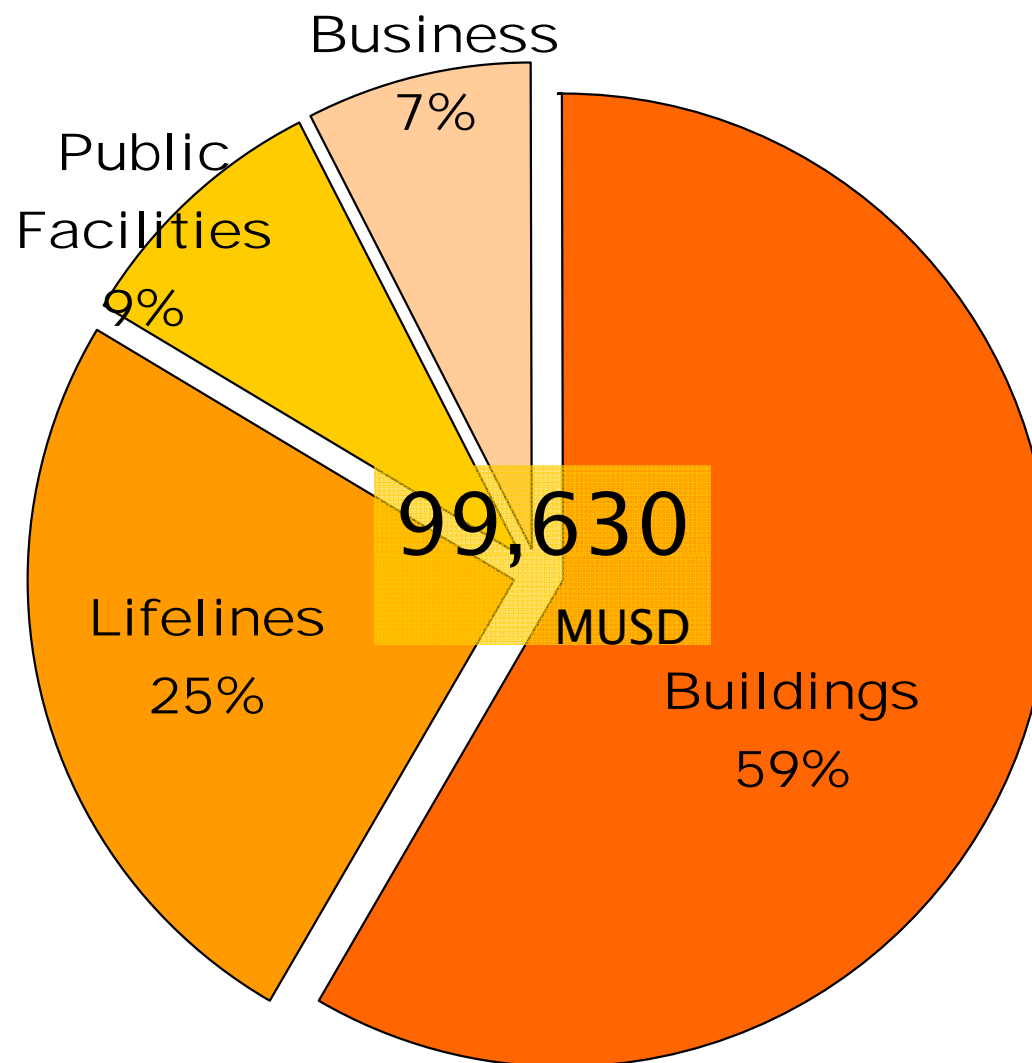


Recovery Process of Utility Services





Damage & Losses: 99,630 Million US Dollar Worth





By experiencing unprecedented
scale of urban earthquake disaster,
we learned

- Long Term Recovery Management became an important new issue for disaster research community
- It took 10 years before the direct impact of earthquake was overcome



Three Goals of Recovery Plan

Physical Recovery

Reconstructing Destroyed Cities

+

Economic Recovery

Revitalizing Local Economies

Life Recovery

Helping Disaster Victims



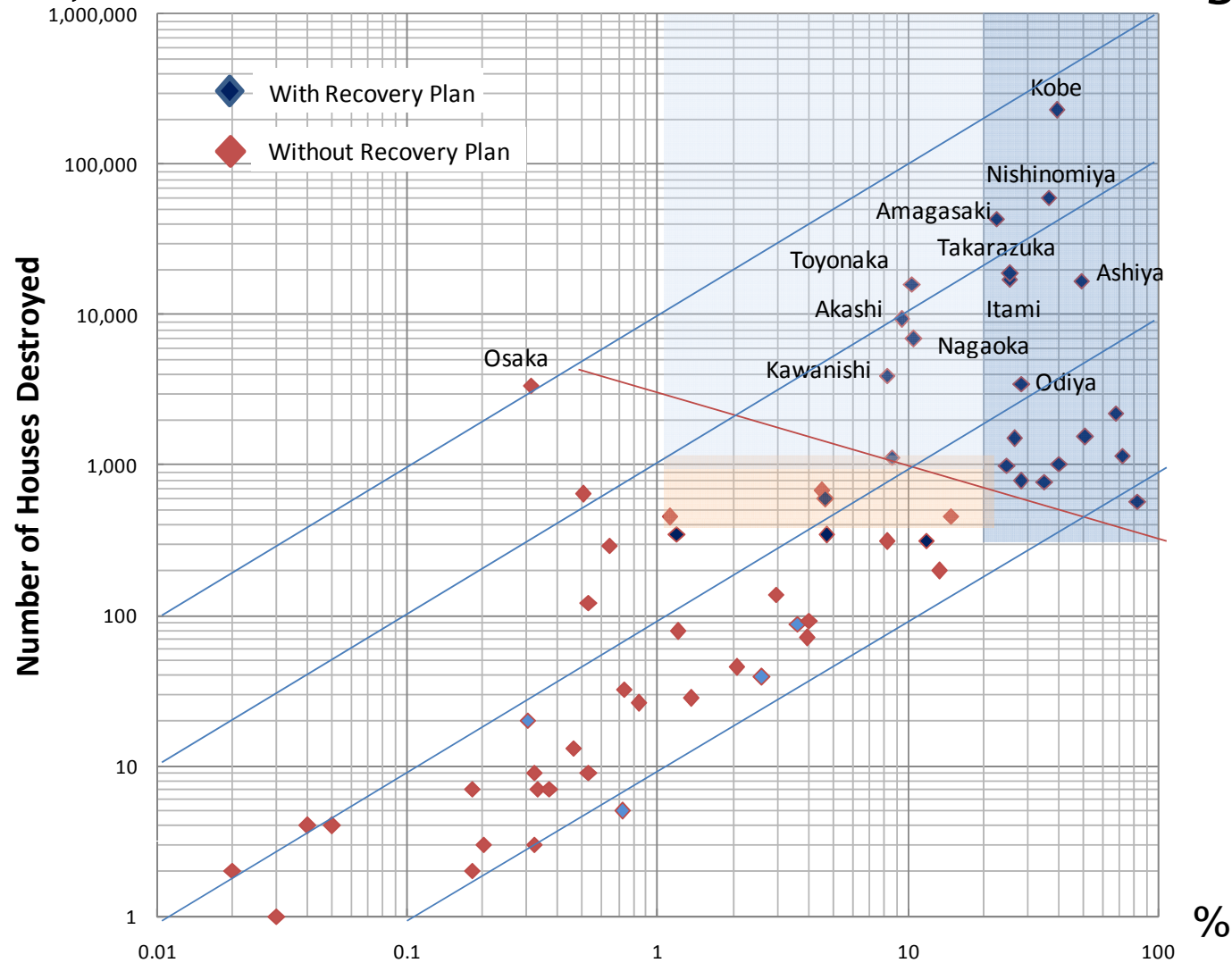
Importance of Recovery Planning

- Recovery is not just restoring what it was before the disaster
- Recovery is a great chance for realizing a better and sustainable way of life: a new ideal
- Recovery planning is the key for taking coordinated and cooperative actions to realize the new ideal among all stakeholders



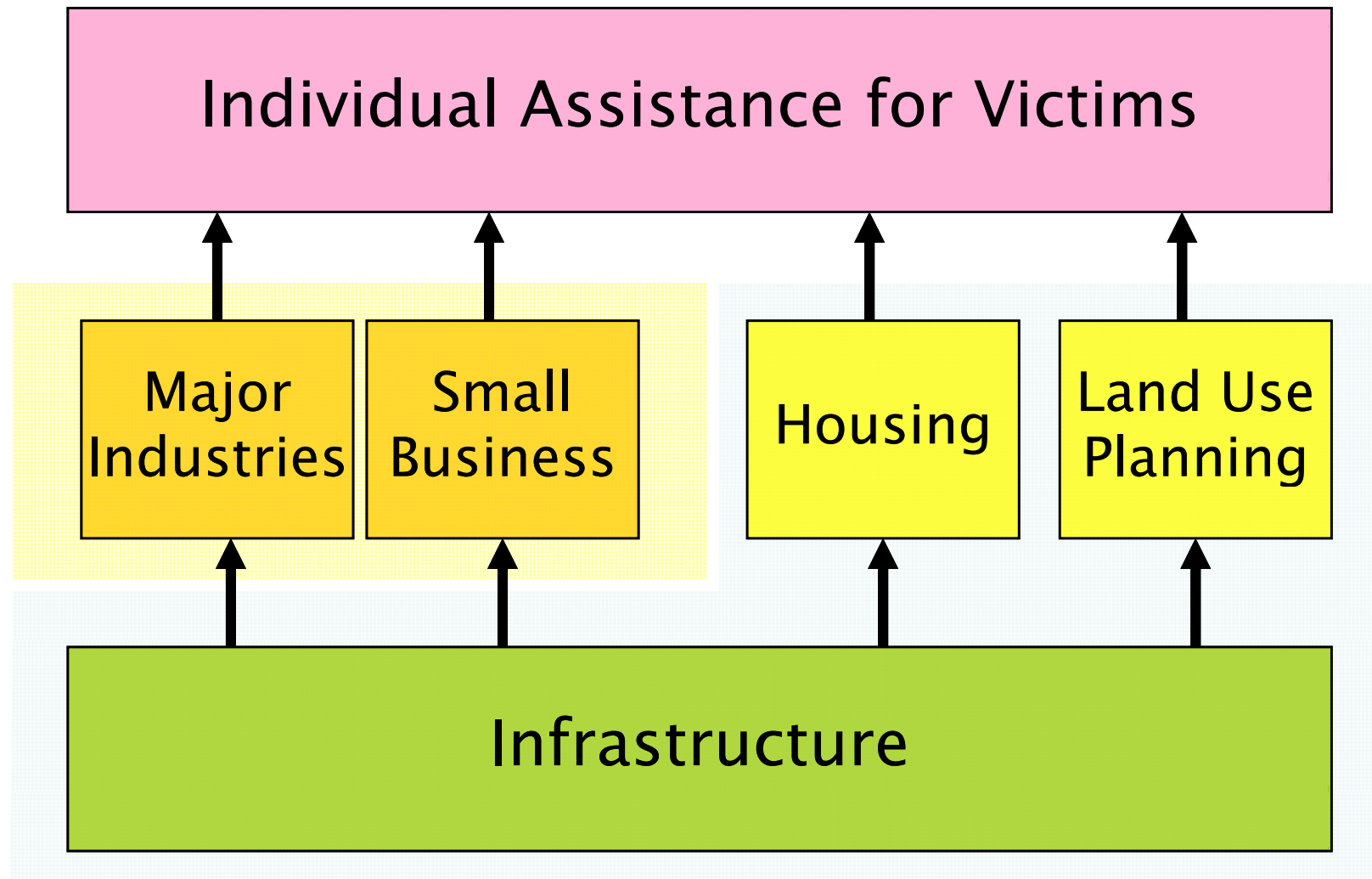
Municipalities with Recovery Plan

if 1,000+ House or Over 10% of Stock Damaged



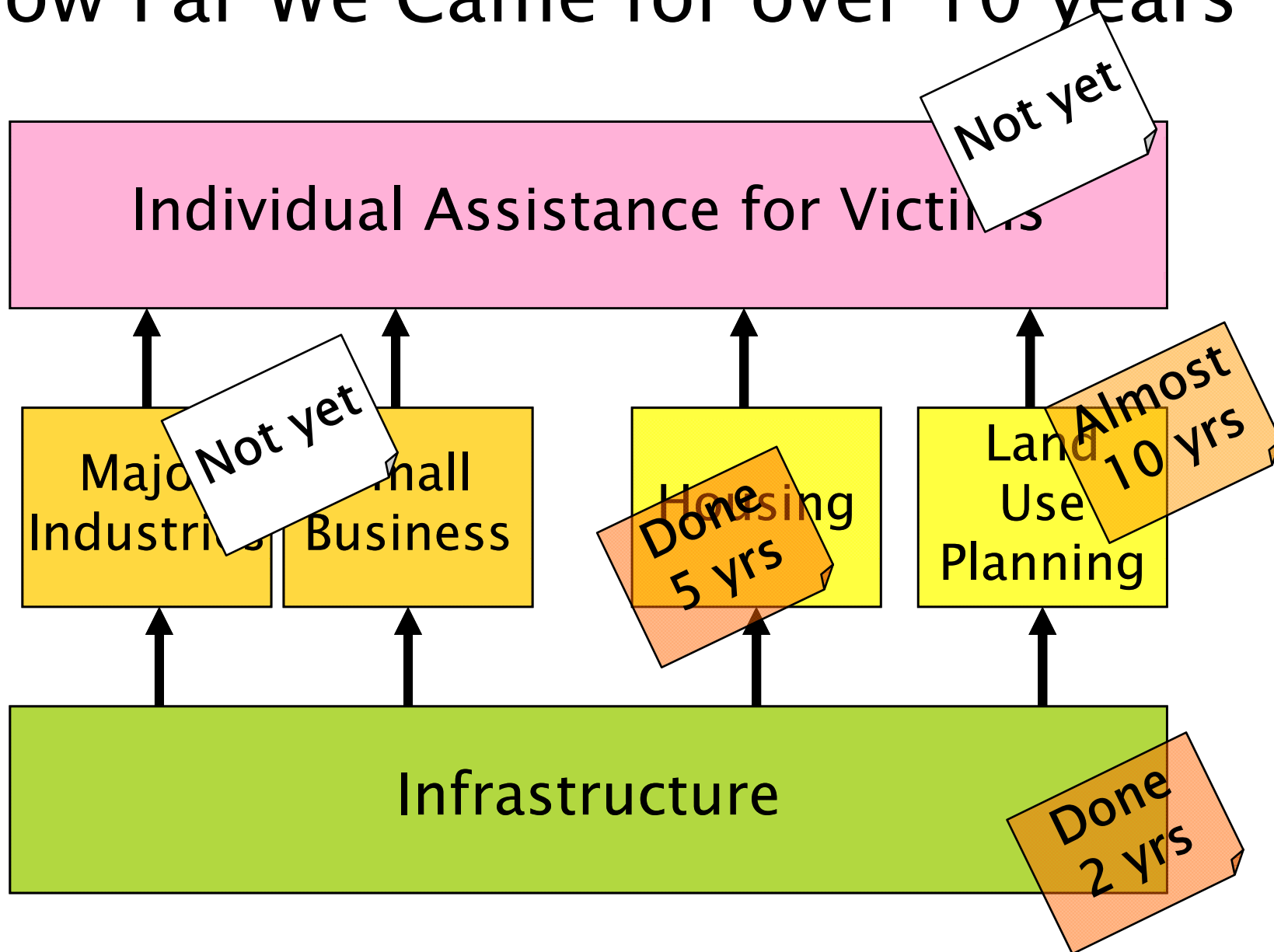


Basic Structure of Recovery Program





How Far We Came for over 10 years





Physical Recovery

Reconstructing Destroyed Cities:

Success



What was done

- **Wise Land Use Planning**
 - Planning First
 - Moratorium for the First Two months to prohibit building construction
- **Quick Debris Removal: 1 year**
 - Recycle debris by discriminating materials
- **Quick Restoration of Infrastructure:**
 - In 2 years
 - Basis of all kinds of recovery activities
- **Providing Places to Live for Victims:**
 - In 5 years, no temporary housings left
 - Enforce 'building codes' strictly for a higher seismic performance



Why success

- Based on Lessons Learned from Many Past Disasters
 - 1923 Kanto Earthquake,
 - Post WWII Reconstruction
 - Large Scale Fire Incidents
- Specific Numerical Targets were Established
 - In the First Five Years, Physical Recovery was Completed



Long-term Physical Recovery

From July, 1995 to March, 2000



Residential Area

Higashinada Ward, Kobe City



Commercial/Residential
Mixed Area

Nagata Ward. Kobe City

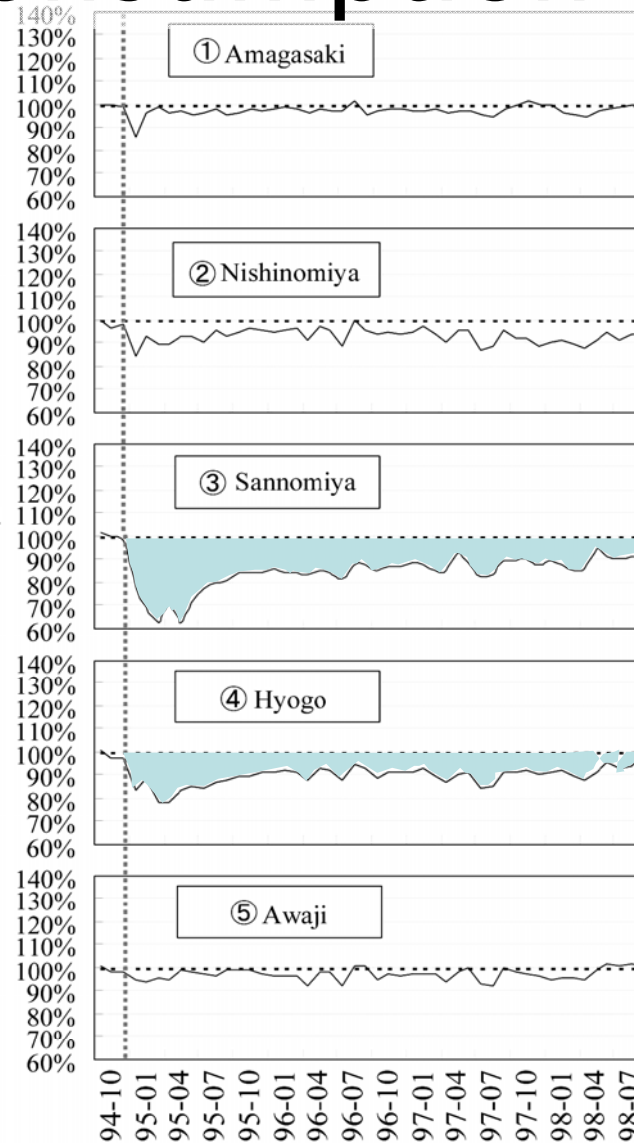
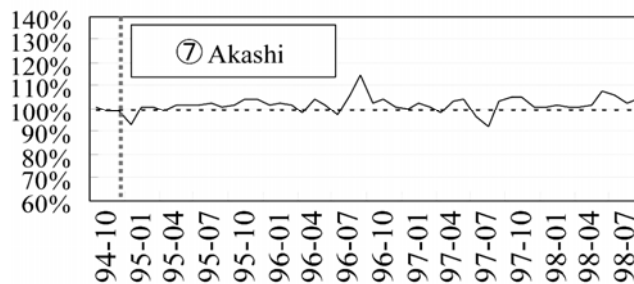
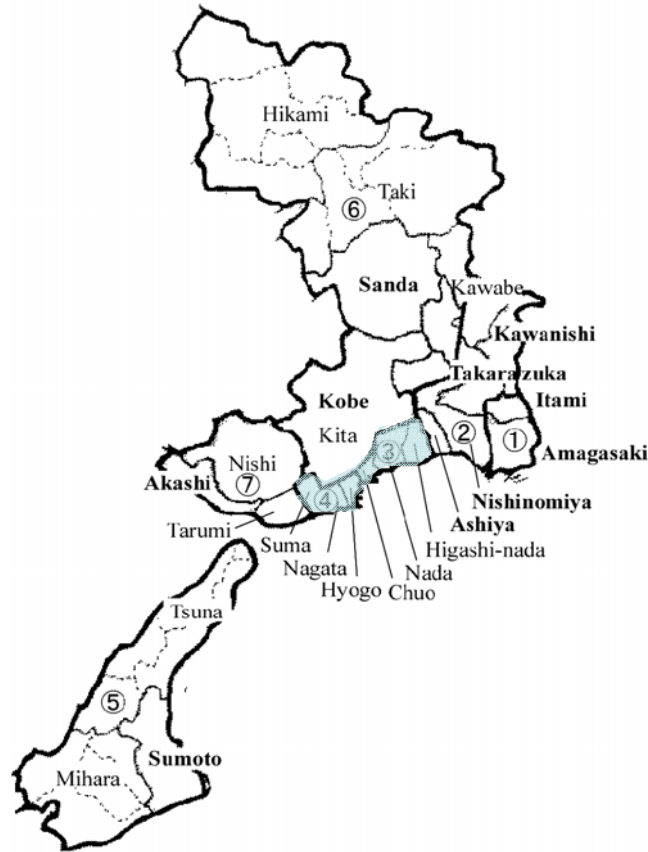
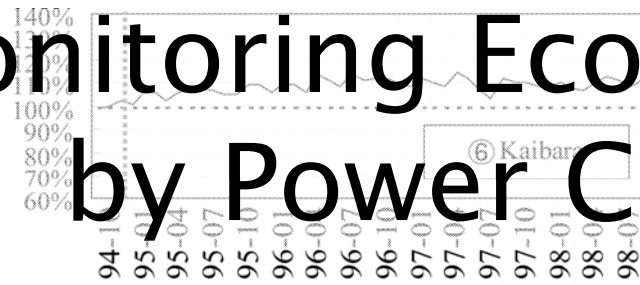


Economic Recovery

Revitalizing Local Economies:

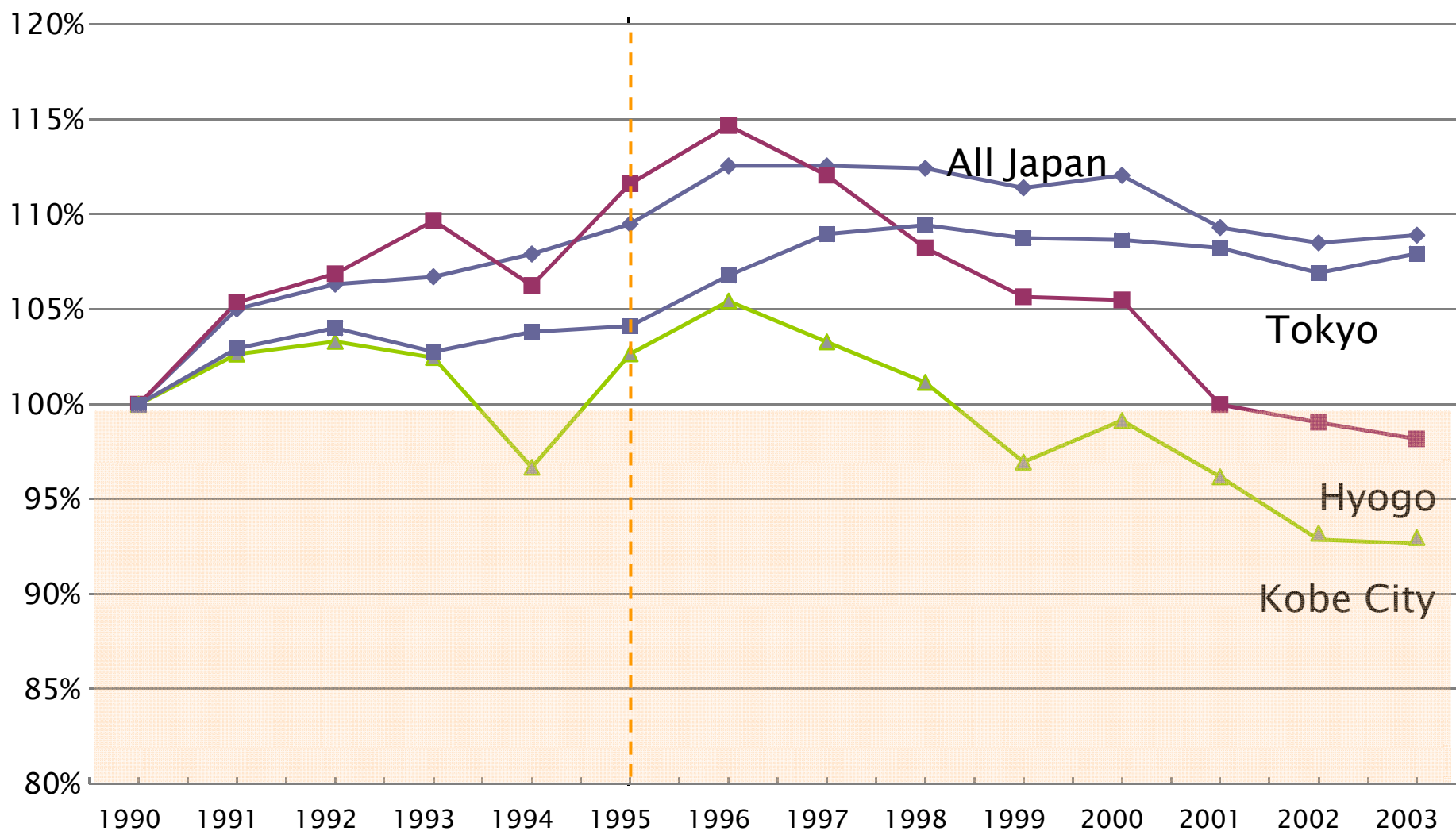
Partially Success

Monitoring Economic Recovery by Power Consumption



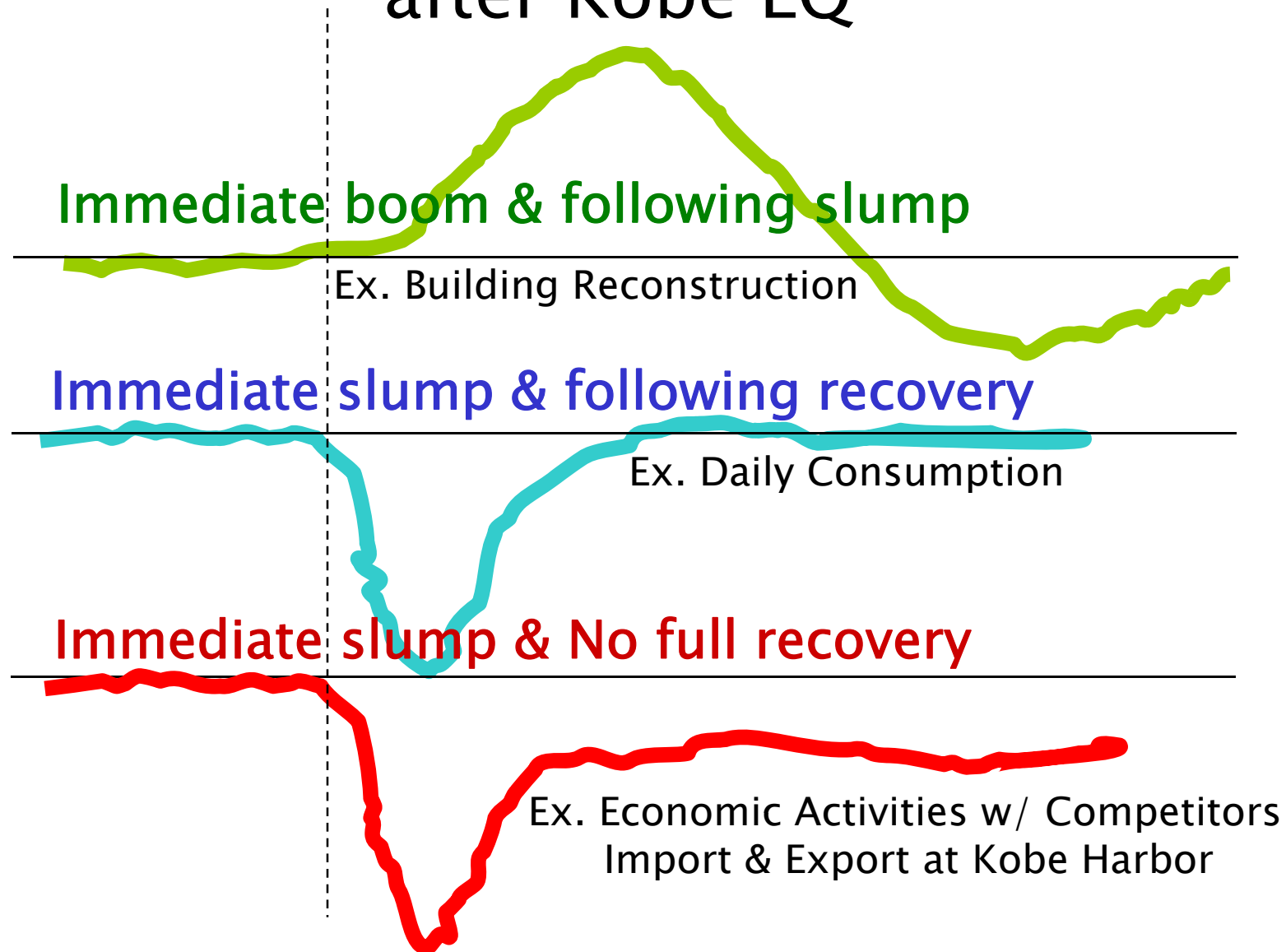


Changes in GDP & GRP after Eq



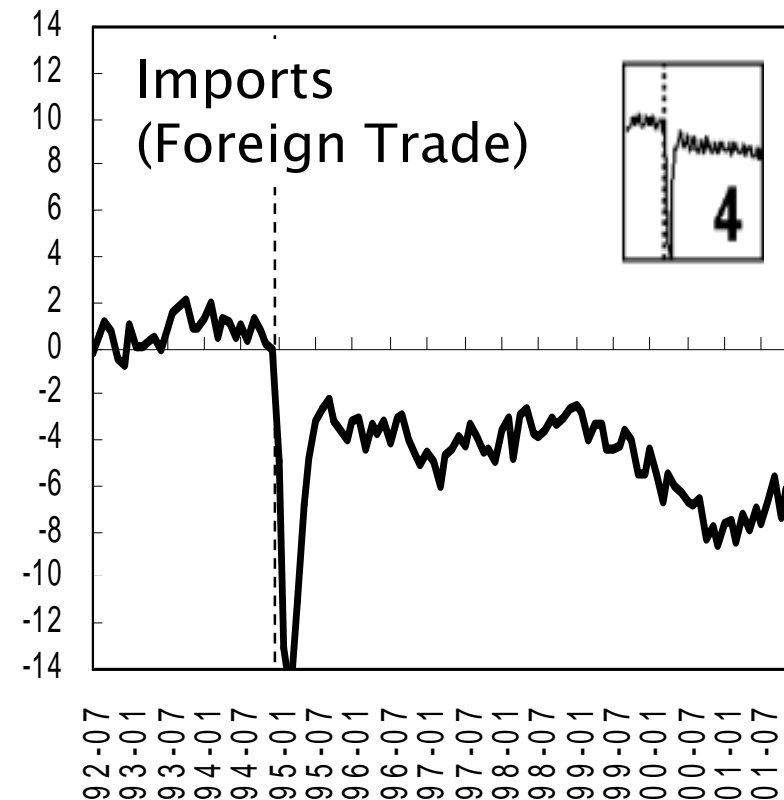
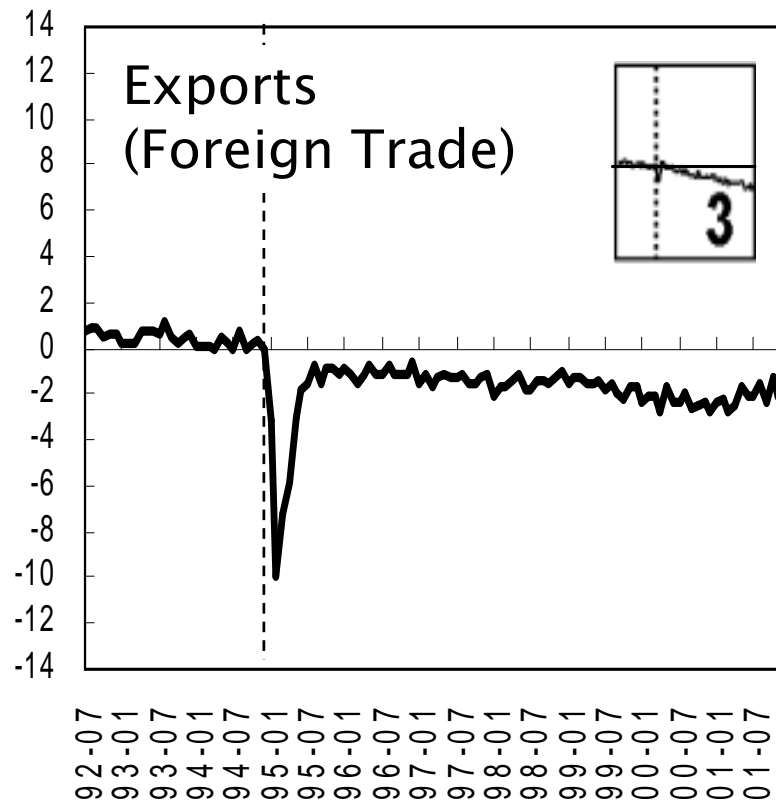


Three Basic Economic Recovery Patterns after Kobe EQ





Monitoring Economic Recovery by City Statistics





Why Partial Success

- Over-concentration of national government money and work for a very short time period killed local business recovery
 - Major Contractors in Tokyo got contracts
 - Little “Trickle-down” effect for local small business
 - 10 years worth housing renewal was completed in 3 years, followed by big economic slump
- Over-reliance on Public Spending by Victims
 - Little Initiative for Promoting a New Economy Development
 - Government was the only risk taker
- Customers Never Waited for recovery
 - Shift to competitors and never returned to old days
 - Importance of Business Continuation Plan



Life Recovery

Helping Disaster Victims:

Partial Success

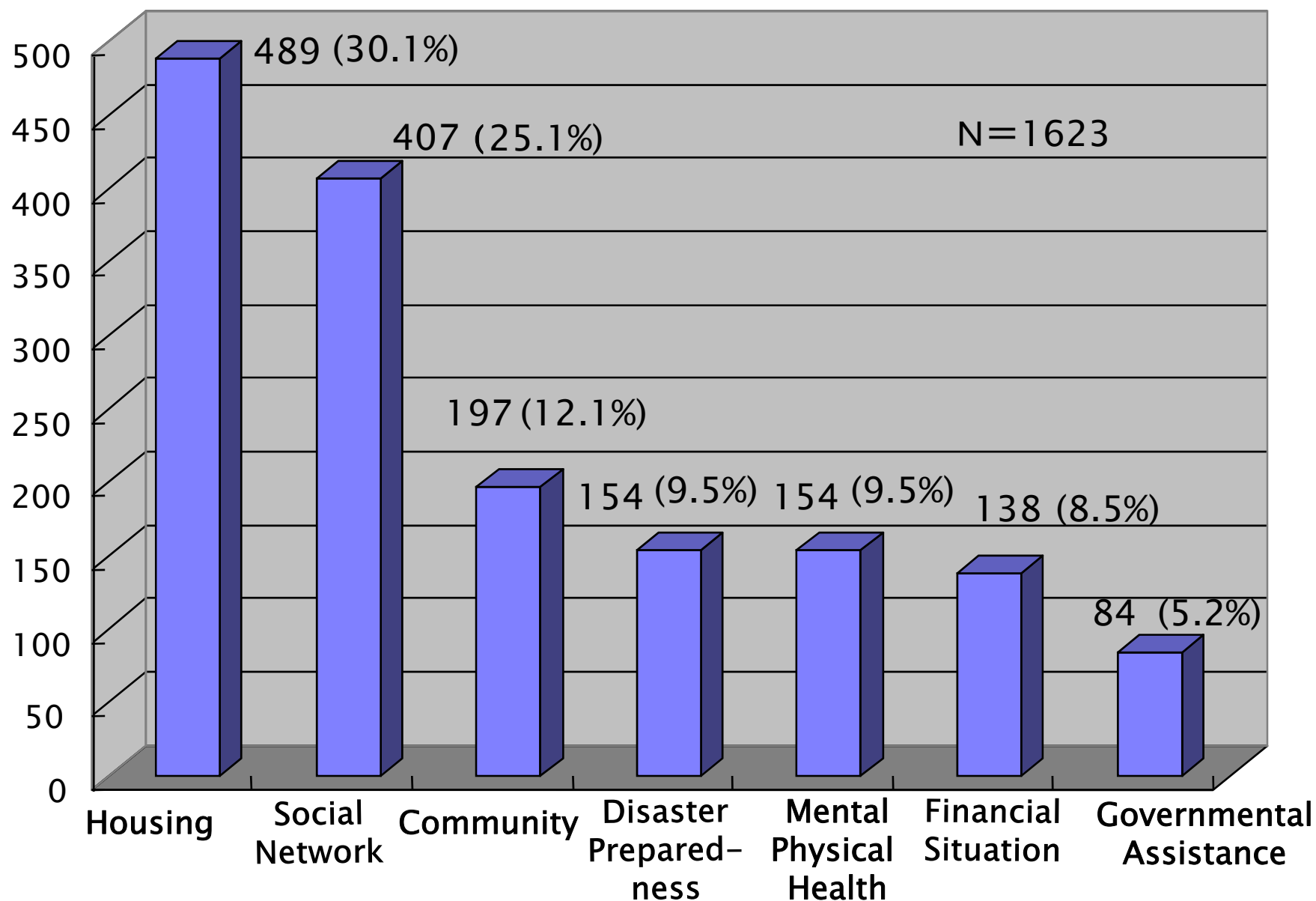


Life Recovery

- New Development
- Nobody Can Define
 - Scope of Work
 - Desired End State
 - Need for Ethnographic Inquiry of Meaning of Recovery
- Public Help was provided mainly for Low-Income and/or Senior Citizens

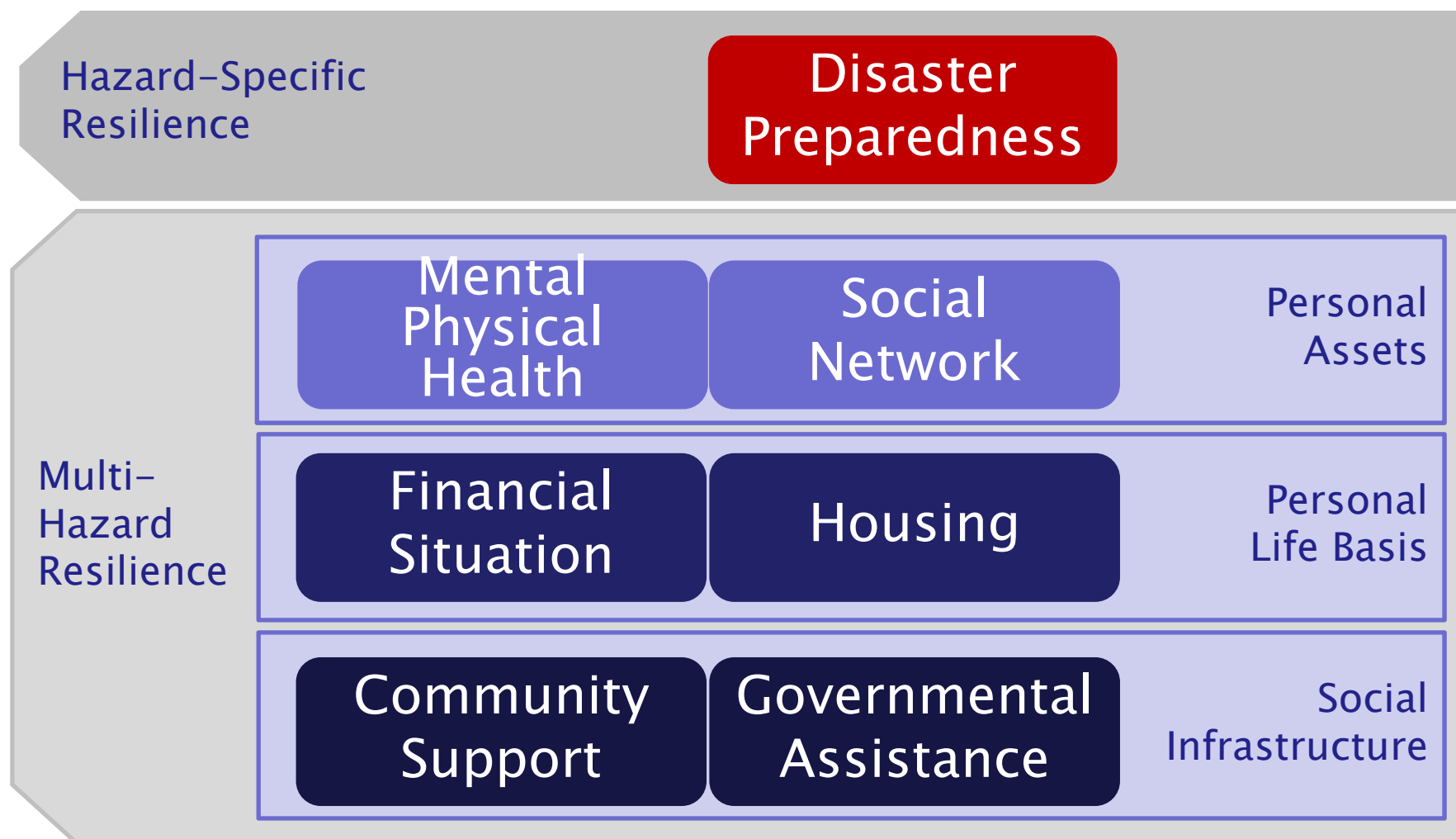


Seven Elements for Life Recovery



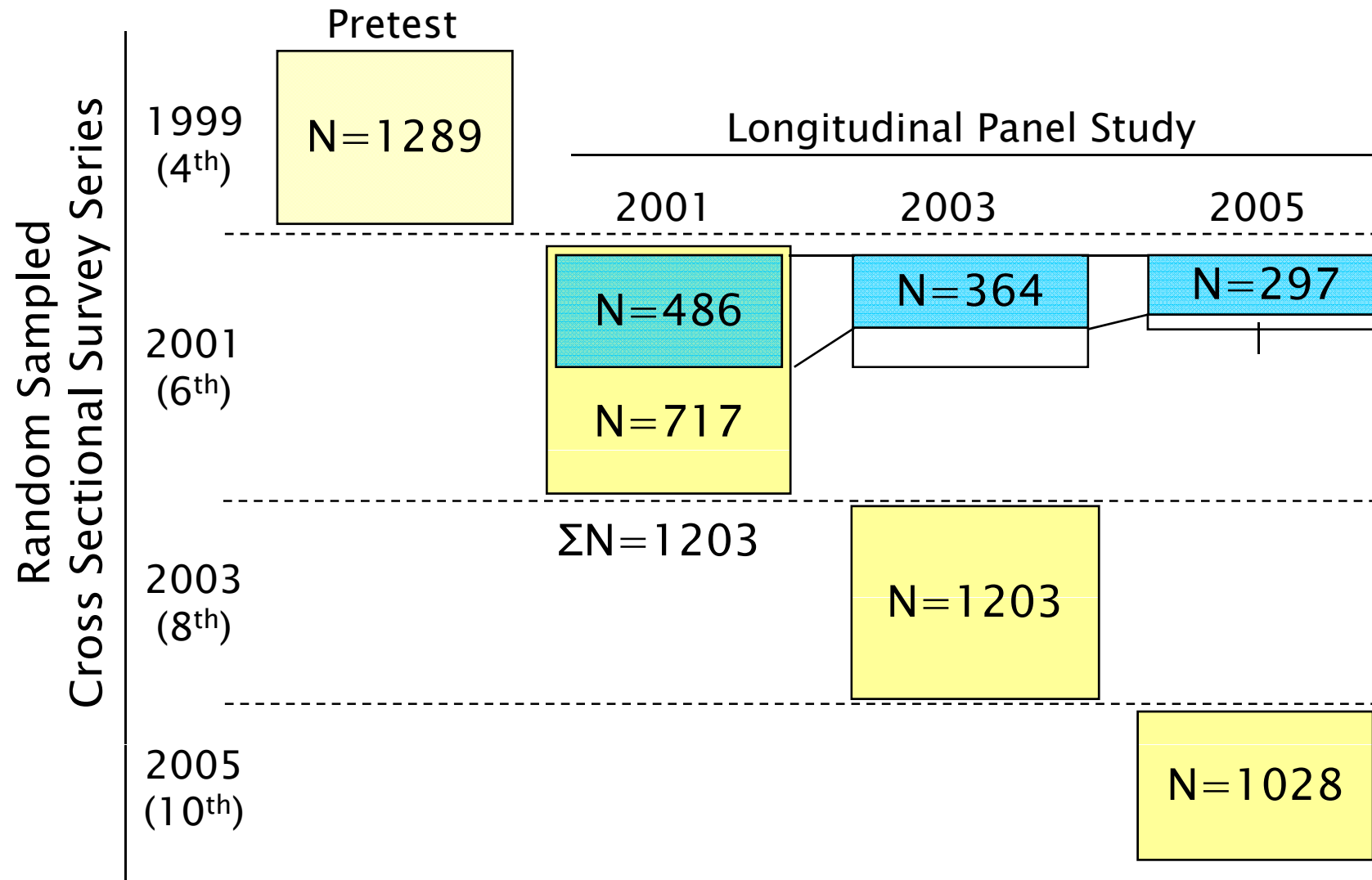


Resilience Model





Holistic Recovery Research by Hyogo Prefecture and Kyoto University





Recovery Timeline

- When the disaster victims thought the followings were recovered or restored
- Chronological Change in Percentage of those who thought recovered in terms of log scale

—●— Work and/or School (n=405)

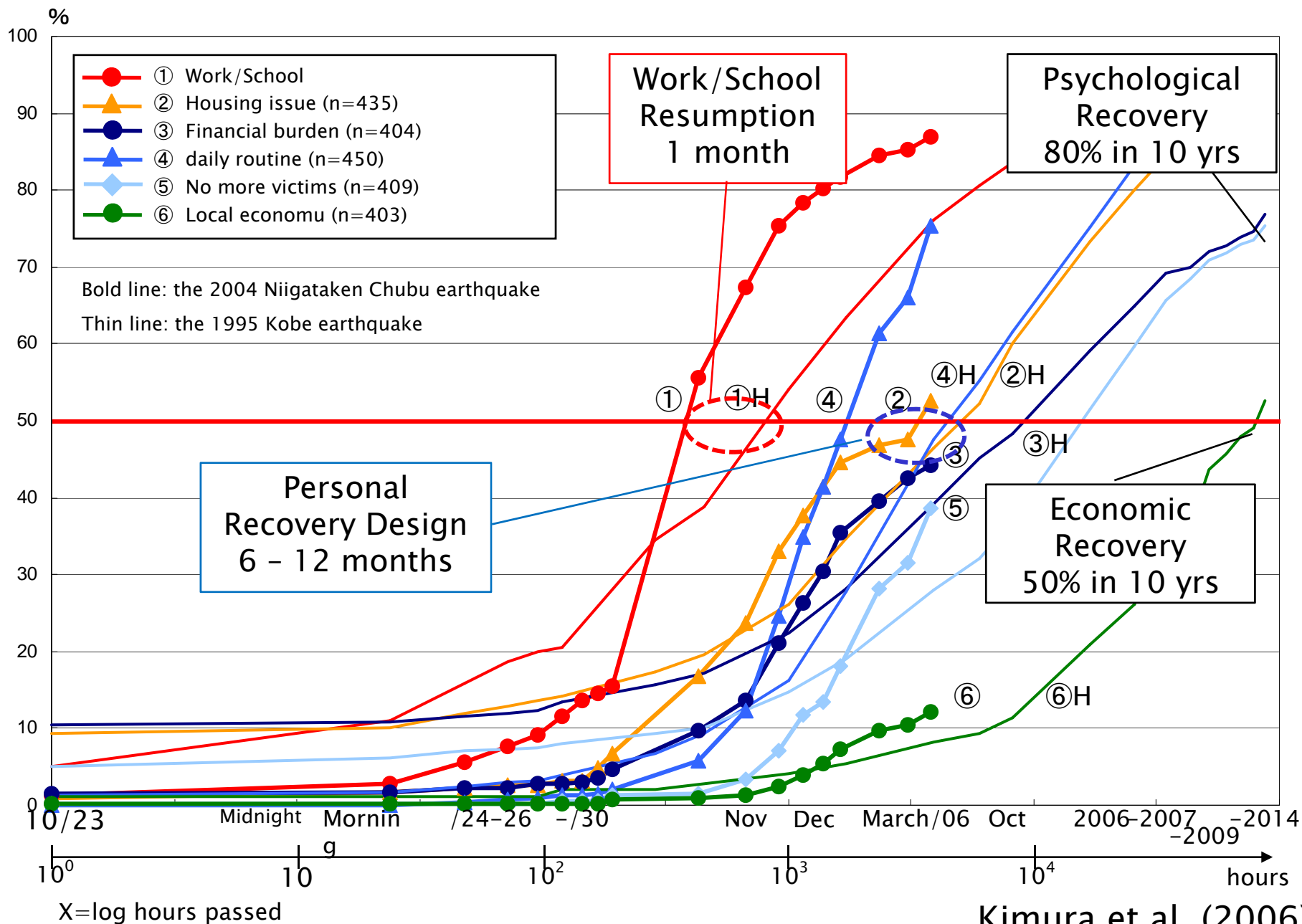
—▲— Housing issues (n=435)

—●— Financial burden (n=404)

—▲— Daily routine (n=450)

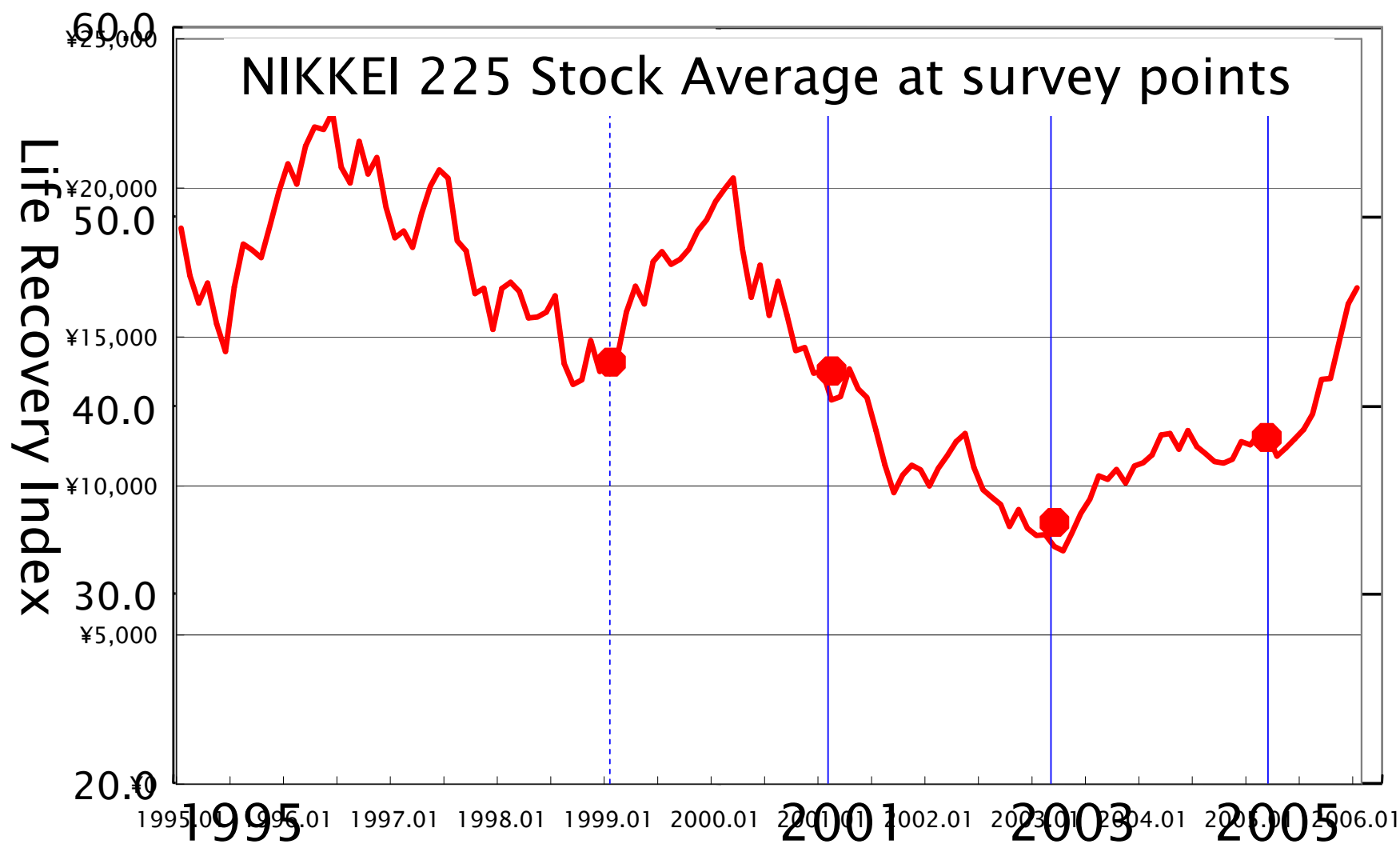
—◆— No more victims (n=409)

—●— Local economy (n=403)





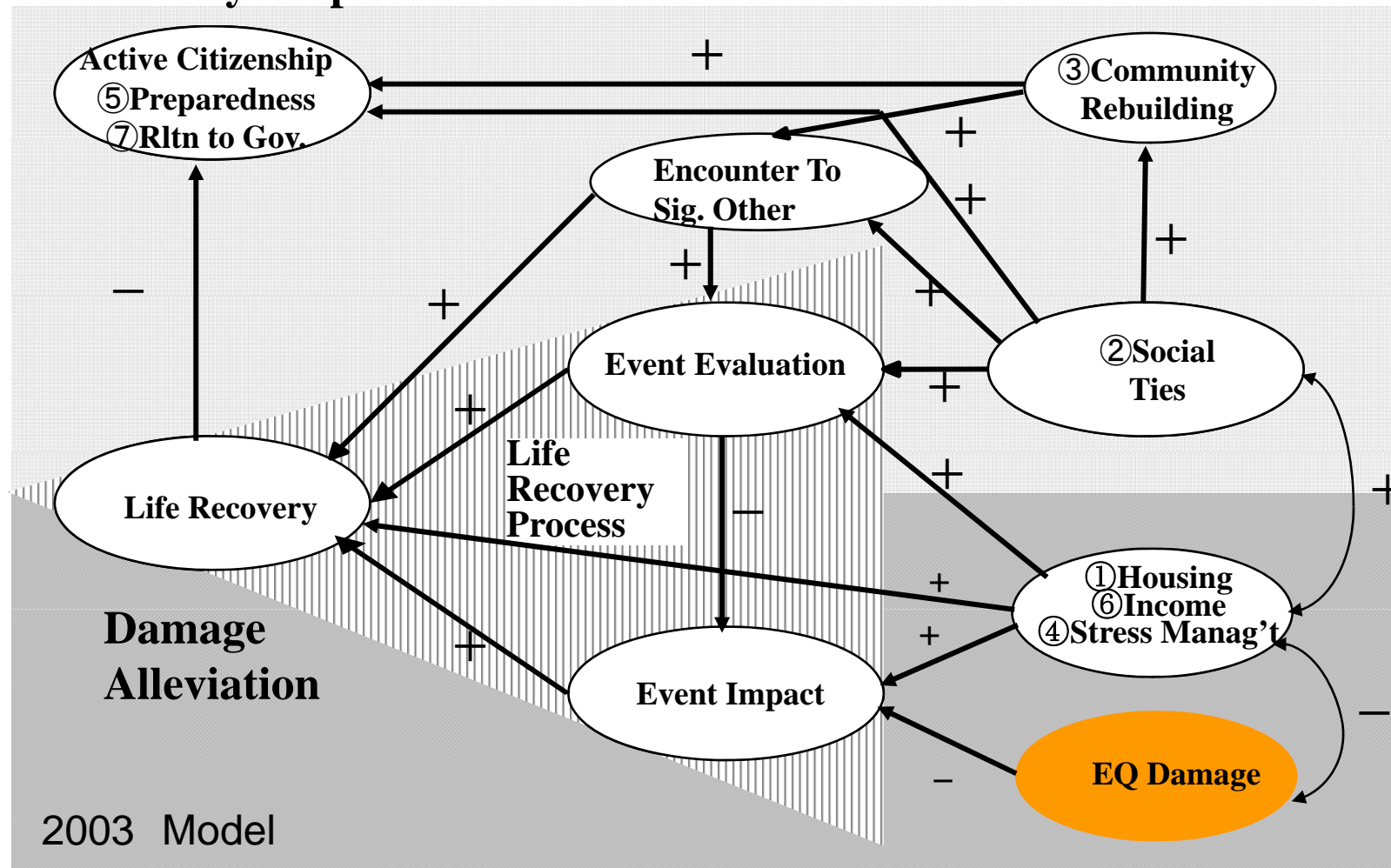
National economy strongly influences Life Recovery





Bird's-eye view of life recovery process: The 2003 study results (N=1,203, Jan. 2003)

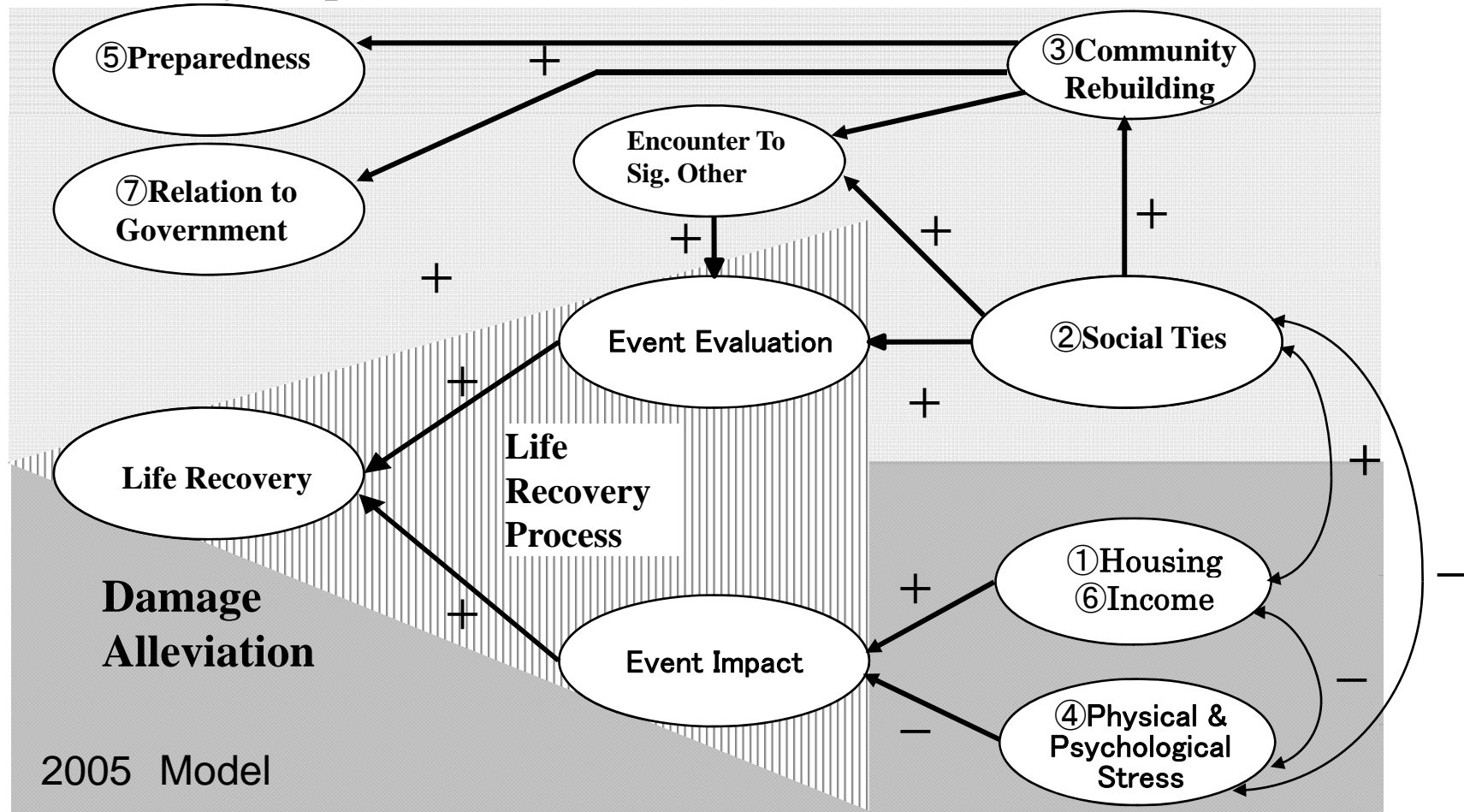
Community Empowerment





Bird's-eye view of life recovery process: The 2005 study results (N=1,028, Jan. 2005)

Community Empowerment





Towards Integrated Model of Recovery

Relationship among Three Goals

Economic Recovery

Revitalizing
Local Economies

as a Result

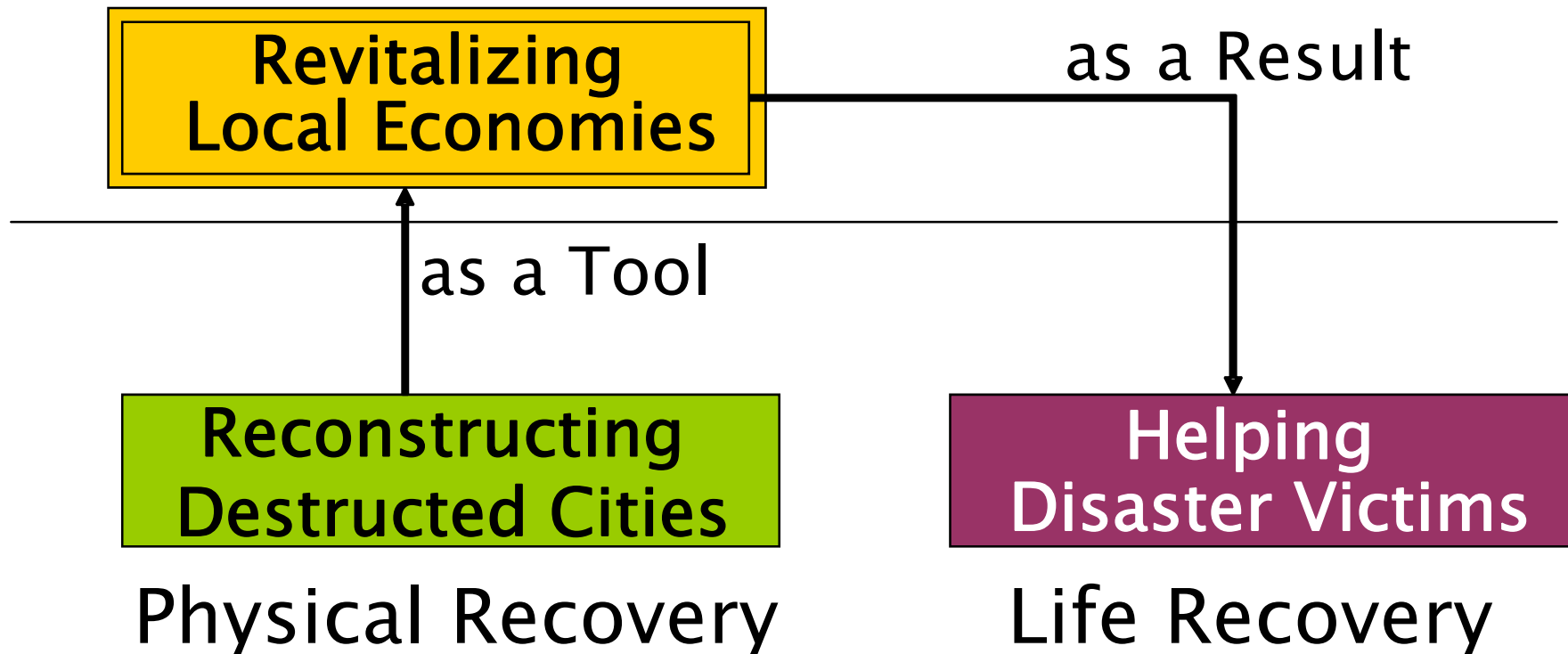
as a Tool

Reconstructing
Destroyed Cities

Physical Recovery

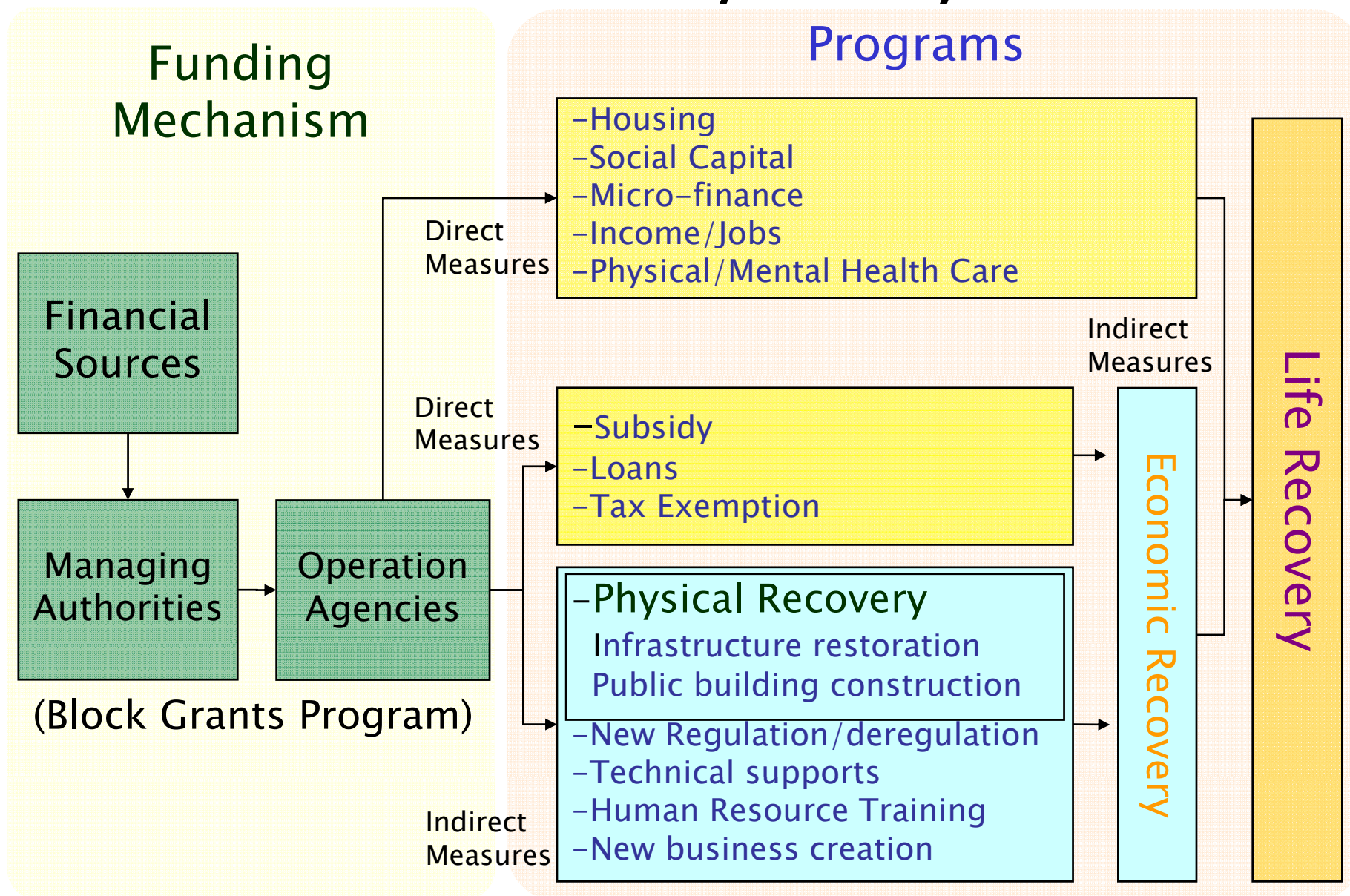
Helping
Disaster Victims

Life Recovery





Holistic Recovery Policy Model





Towards Integrated Model of Recovery Relationship among Three Goals

- Programs
 - Life recovery is the ultimate goal
 - Use both Direct and Indirect Measures
 - Economic recovery is an indirect measure for life recovery
 - Physical recovery is an indirect measure for economic recovery
- Funding Mechanism
 - Identify Funding sources, Managing Authorities, and Operating Agencies
 - National Government is not a single resource
 - Community Block Grant Approach



Summary

- Long Term Recovery is a time consuming and complicated process
- Long Term Recovery Management became an important new issue for disaster researchers and practitioners
- There at least three goals of recovery to be achieved: Physical recovery, Economic recovery, and Life recovery
- Activities for achieving these three goals should be coordinated
- Economic recovery should be the prime target,
- use physical recovery as the tool to achieve it, and
- life recovery as a consequence
- Pre-planning of recovery strategy really helps prevent and reduce potential damages
- Recovery planning should be holistic in nature, and participatory in action
- Don't rush, take time for recovery