

Understanding and Applying the Concept of Community Disaster Resilience: A Capital-based Approach

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Presentation Outline

- ➔ Introduction
- ➔ Motivation and objective
- ➔ Working definition
- ➔ Proposed framework
- ➔ Mapping and unit of analysis
- ➔ Summary and recommendation

Introduction

- ➔ The Indian Tsunami of 2004, Hurricanes Katrina and Rita in 2005, illustrate that communities are becoming vulnerable.
- ➔ In the last decade, natural disaster (Birkmann, 2006),
 - Affected more than 3 billion people
 - Killed over 750,000 people
 - Cost about US\$ 600 billion
- ➔ The goal of disaster risk reduction has shifted to focusing on building community resilience.
- ➔ However, it is not clear how community resilience should be measured.

Motivation & Objective

➔ Motivation

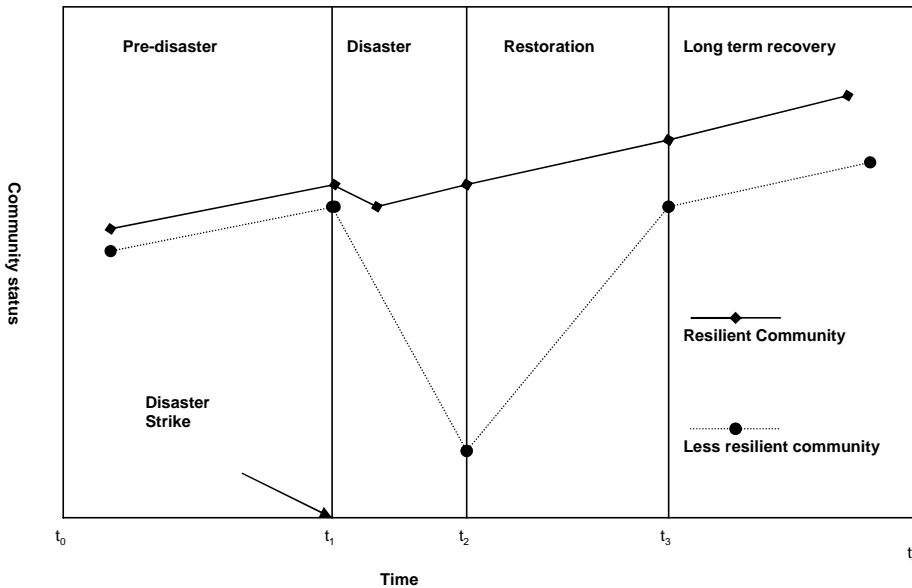
- Current paradigm shift from vulnerability assessment approach to resilience-based approach.

➔ Objective

- To develop a conceptual and methodological framework for assessing and mapping community disaster resilience.

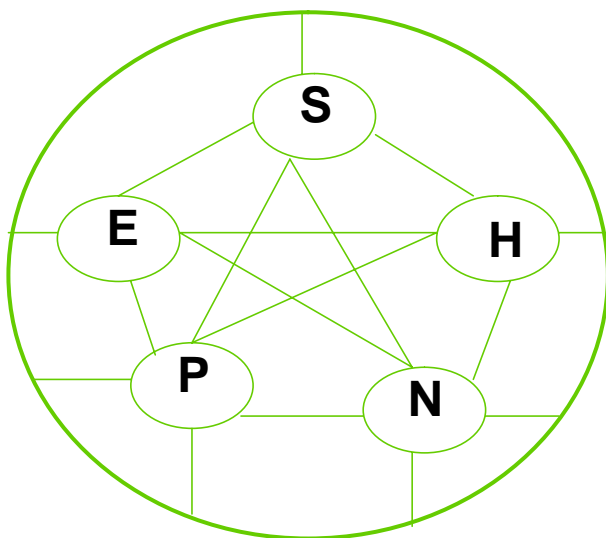
Working definition

➔ **Community disaster resilience** is the capacity or ability of a community to anticipate, prepare for, respond to, and recover quickly from impacts of disaster (See the figure below).



Schematic illustration of community disaster resilience

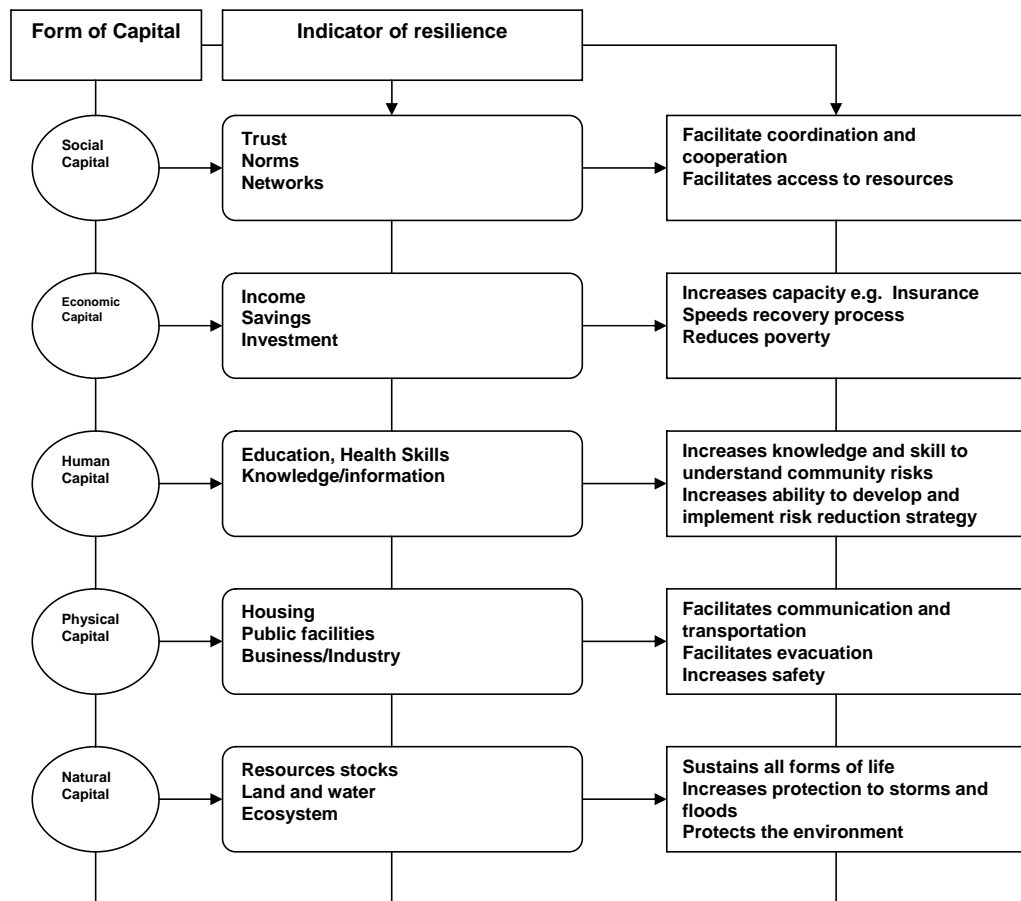
Elements of Resilience



- S** = Social Capital
- H** = Human Capital
- E** = Economic Capital
- P** = Physical Capital
- N** = Natural Capital

Resilient community

Proposed Framework



Combining indicators

➔ For instance, an index for a domain capital “y”

$$y_i = \sum (X_1 w_1 + X_2 w_2 + X_3 w_3 + \dots \dots \dots X_n w_n)$$

Where

y_i =Capital index

X =Indicator

w =Weight

n =Number of indicators or weight considered

i =indicator number

Combining domains

➔ Community disaster resilience index (CDR_i)

$$CDR_i = \frac{\sum (w_1 SC_i + w_2 EC_i + w_3 HC_i + w_4 PC_i + w_5 NC_i)}{n}$$

SC_i=Social Capital index

NC_i=Natural Capital index

EC_i=Economic Capital index

W=Weight

HC_i=Human Capital index

n=Number of Capital

PC_i= Physical Capital index

CDR_i=Community Disaster Resilience index

Mapping & Unit of Analysis

➔ Maps

- Can be generated using GIS technology.
- Are most important decision support tools for planning and management.
- Can be used to identify the least resilient communities.

➔ Unit of analysis

- Can be chosen based on where local decisions are invested.
- Can be chosen based on the ability to influence policy.

Summary & Recommendation

- ➔ This concept is still too broad to be used as guide for policy and disaster mitigation measures.
 - ➔ The forms of capital encompass many dimensions some of which are difficult to quantify.
 - ➔ The proposed framework provides a starting point for developing a more robust methodology.
 - ➔ Establishing weights is a complex processes. More research is needed to establish sophisticated techniques.
 - ➔ The proposed framework and methodology are both still under development, thus are subject to change.
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Thank you for your attention

Questions.....