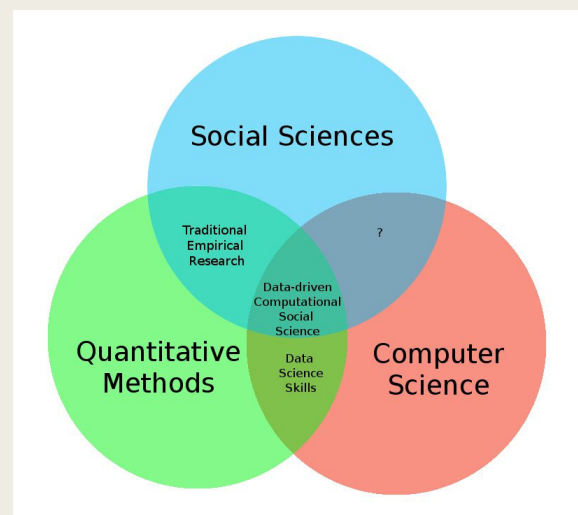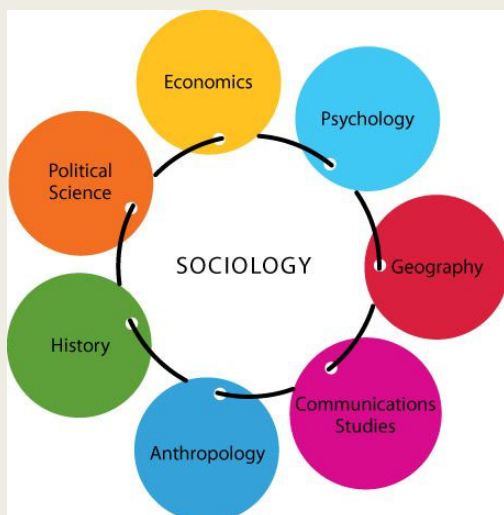# APPROACHES OF SOCIAL SCIENCES TO DISASTER MITIGATION

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What are social sciences? Their methods?
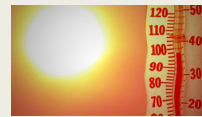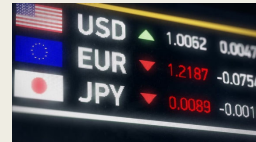
Lecture outline

- 1. Disaster as a process

- 2. Exposure to risk

- 3. Social vulnerability
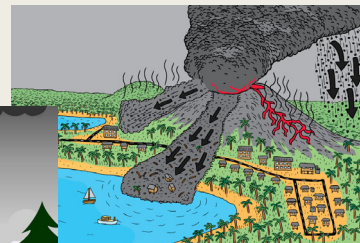
- 4. Cultural resilience

- Conclusions

1. DISASTER AS A PROCESS

Are these all disasters?

NATURAL HAZARD ARE NOT DISASTERS

A disaster is a human centered concept (anthropocentric)

Human settlement + Hazard = Disaster

Slide 1

D I S A T E R

Process → Event → Process

Drives fast everyday

Slide 2

D I S A T E R

Process → Event → Process

human-environment relations

development

preparedness/unpreparedness

social inequality

Vulnerability
Risk

Earthquake
Tsunami
Drought
Avalanche
Flood
Hurricane
…

Reconstruction
Spiritual care
Financial aid
Technological support
international/national solidarity
Political leadership

Resilience
Adaptation

housing recovery TIMELINE

- short term: emergency shelter
- intermediate: temporary housing
- long–term: permanent housing

image modified based on: http://www.lpdr.org/2012/11/16/the-anatomy-of-a-disaster/

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2. EXPOSURE TO RISK

NATURAL RISKS

* Natural phenomena bring a set of opportunities and risks.

* "The risk inherent in nature consists of a wide range of hazards that put constraints on production (e.g. frosts affecting agriculture) and on other aspects of livelihoods and safety (earthquakes, floods, droughts, etc.)." Cannon 1994: 14.

Volcanic mountain – fertile soil (opportunity) vs. eruption (risk)

Risks are not limited to natural hazards but also depends on human behaviors. Some time needs dominate risk.

Coastline – Fishing (opportunity) vs. Flood (risk)

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Environmental RISKS

Nuclear plant, France

The environment in which humans live is a social construction.

Pollution, London 1953

Global warming, Tokyo

- Risk is **not** an objective fact.

- Risk perception will dictate people's adaptation and disaster mitigation

- Risk perception and adaptation will be dependent on "political, economic, and social forces, obliging people to adapt to an institutional environment as well as a natural one." (Vayda and McKay 1975)

- "We can frequently be the cause of our own hazardous situation."(Oliver-Smith: 26)

3 SOCIAL VULNERABILITY

Which car would you prefer to be in?

Which car would you prefer to drive?

In a car accident, some people are more vulnerable than others.

If it is true in car accident, why not during a natural hazard?

Vulnerability is not equal within a group, a society or a culture

"Vulnerability is a characteristic of individuals and groups of people who inhabit a given natural, social and economic space, within which they are differentiated according to their varying position in society into more or less vulnerable individuals and groups."

(Cannon 1994: :19)

DIFFERENCE in Vulnerability

Nepal Earthquake 2015 (7.6M)   vs   Tohoku Earthquake 2011 (9.1M)

Heat wave, Paris 2003 (15,000 victims)   vs   Heat wave, Tokyo 1994 (600 victims)

Vulnerability within a group

■ The idea that we are all equal in disasters is a myth.

■ Vulnerability is the degree to which people are exposed to risks. Some people are more exposed to risk than others, the same way some people are more exposed to opportunities than others.

■ Research shows that ethnicity, class, gender, disability, age, poverty, education, and so on makes people more vulnerable than others.

■ Types of vulnerability: livelihood vulnerability, self-protection and social protection.

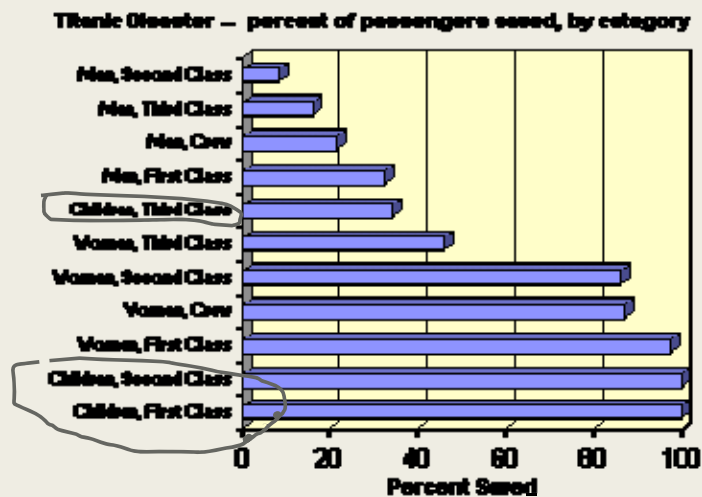How to identify VULNERABILITY?

Forensic research

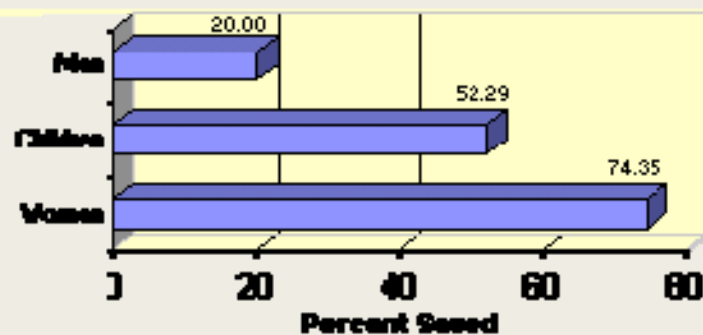
Who are the survivors/victims of the Titanic?

The social class issue

Titanic Disaster — percent of passengers saved, by category
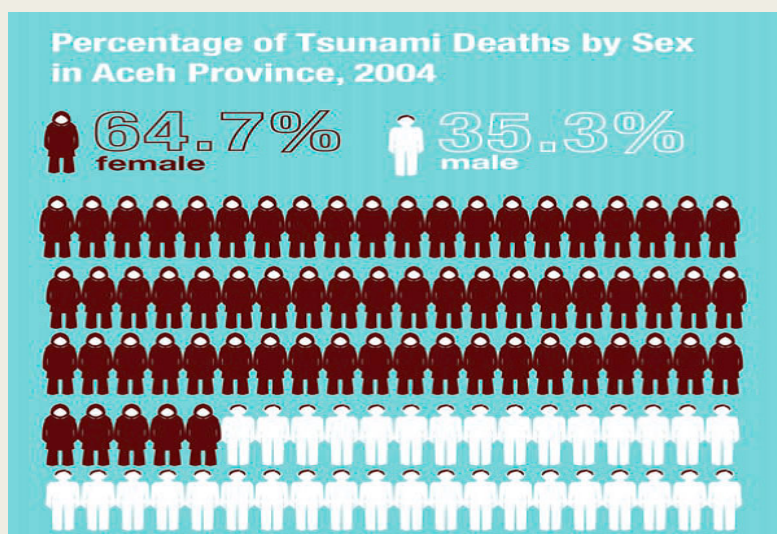
The gender issue

Titanic Disaster — percent of passengers saved, showing effect of "sex discrimination"

# Who are the survivors/victims of the 2004 Tsunami?

The gender issue

Percentage of Tsunami Deaths by Sex in Aceh Province, 2004

64.7% female   35.3% male

Why such a gender difference?

- Is it about this <u>physical strength</u>? NO
- <u>Women tend to work at home near the coast.</u> Only their strength and luck could save them.
- <u>Men tend to work inland/city (</u>offices, etc.) where shelters and escape roots are more likely to be available.
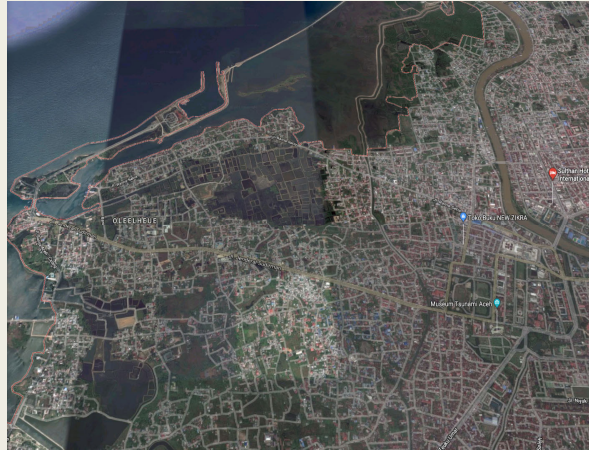
Map of Banda Aceh City, 2017.

How do people create vulnerability?

- Development: when men build an environment, they make choice that will make (some) people more vulnerable to the risks of hazards.

- Inequalities: the more a society is based on principal of inequalities the more it creates vulnerable people. Class structures, ethnic groups, gender, marginalization (disability, travelers, homeless, etc.).

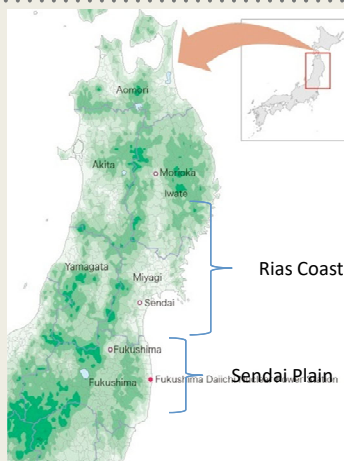Attention this idea is relative – if all people are equal in being highly vulnerable, this system still contributes.

- Man-made risks: humans can create their own environmental risks through war, conflicts, technological hazards, nuclear plants, etc.

- Reducing vulnerability is not just about survival: It includes also reducing the psychological, social and cultural impacts of disasters.

The Great East Japan Earthquake, March 11, 2011

– *9.0 magnitude earthquake*
– *tsunami-40 meters run up*
– *fires*
– *nuclear accident and meltdown*

THE Great East Japan Earthquake, March 11, 2011

Rias Coast

Sendai Plain

Rias Coast: lack of buildable land
Source: The Association of Japanese Geographers

Sendai Plain: lack of high land

Source: Mainichi Shinbun,

- ■ 20,000 deaths
- ■ 561 square kilometers inundated
- ■ 129,000 houses totally damaged
- ■ 470,000 evacuees ; 127,000 (Jan.'17)

Planning for permanent housing reconstruction
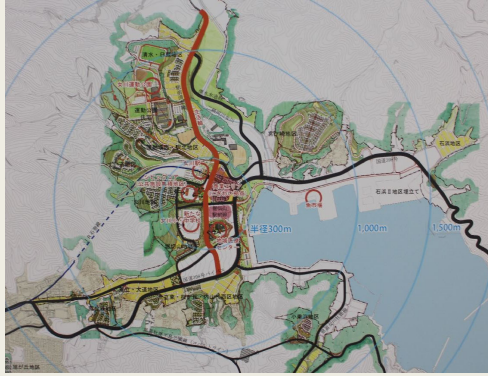
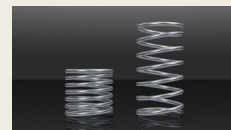# 6 DISASTER RESILIENCE

What is
[resilience](#)?

Etymology 語源

- Latin *resilire* or *resilio* meaning to bounce

23-79 AD, Pliny the Elder, Natural Philosopher, leap of frogs. カエルの跳躍

- 14-17th Century, Middle French, *résiler*, *retract or cancel*

- 16th century, English *resile, to return to former position* or bouncing back

First USAGE FOR DISASTER

- December 1854 Tokai Earthquake, Shimoda City (Tokyo)

- Earthquake 8.4M

- Tsunami 4〜6m

- American researchers described used resilience as "the ability to withstand the effects of earthquake."

Date	December 23, 1854
Magnitude	8.4 M_L
Epicenter	34.0°N 137.8°E
Areas affected	Japan, Tōkai region
Tsunami	yes
Casualties	>2,000

A boat was reported to have been stranded by a tsunami, *Illustrated London News, 1856.*

Shimoda City, Shizuoka

SYSTEMATIC APPLICATION
系統て用法

- Civil protection, 1867: "a resilient steel beam survives the application of a force by resisting it with strength (rigidity) and absorbing it with deformation (ductility)." (Alexander, 2013, 2710).
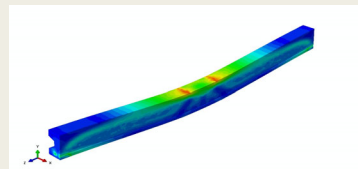

Image of a resilient beam

Earthquake resilient building, Tokyo

SYSTEMATIC APPLICATION

■ Social analogy: "the strength of a human society under stress is its ability to devise means of resisting disaster and maintaining its integrity (coherence), while ductility lies in its ability to adapt to circumstances produced by the calamity in order to lessen their impact." (Alexander 21013 : 2710).
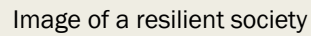
Image of a resilient society
• Preparation
• Adaptation
• Sustainability
• Governance

In a car accident, some people are more resilient than others.

The resilience of some creates the vulnerability of others.

RESILIENT SOCIETIES
is adaptation

Example of cultural adaptation/resilience (1)
Tsunami culture

Simeulue Regency, Indonesia
(Population: 88,335)

❖ Jan 4, 1907: Earthquake M 7.6
earthquake, tsunami 10~20m,
50~70% of death.
❖ Dec 26 2004: M 9.2 earthquake,
10~20m tsunami, Dec 26 2004, 3
victims.
❖ People were saved through oral
history: The story of Smong (tsunami).
(Rahman et al. 2017)
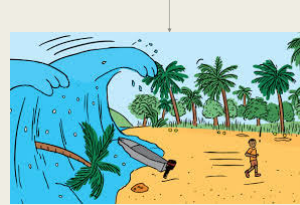
Message of the SMONG STORY

If you feel a large earthquake

check if the sea recedes

Tell everyone to evacuate

If it does, it means that
a smong is coming

EXAMPLE SMONG STORY (Rahman et al. 2017)

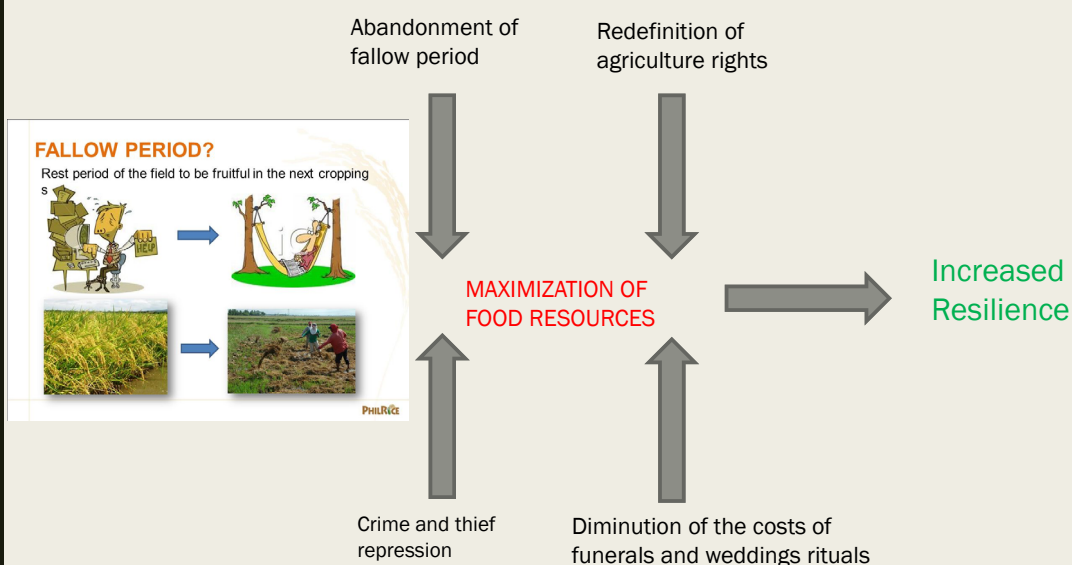| Devayan	English
Enggel mon sao curito	Please listen to this story
Inang maso semonan	One day in the past
Manoknop sao fano	A village was sinking
Uwi lah da sesewan	That's what has been told
Unen ne alek linon	Starting with earthquakes
Fesang bakat ne mali	Followed by a giant wave
Manoknop sao hampong	The whole country was sinking
Tibo-tibo mawi	Immediately
Anga linon ne mali	If the strong earthquake is
Uwek suruik sahuli	Followed by the lowering of seawater
Maheya mihawali	Please find in a hurry
Fano me singa tenggi	A higher place.
Ede smong kahanne	This is called *Smong*
Turiang da nenekta	A story of our ancestors.
Miredem teher ere	Please always remember
Pesan dan nafi da	This message and instruction
Smong dumek-dumek mo	*Smong* is your bath
Linon uwak-uwakmo	Earthquake is your swing bed
Elaik keudang-kedangmo	Thunderstorm is your music
Kilek suluh-suluhmo	Thunderlight is your lamp

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Example of Adaptation/Resilience (2)
Famine Governance (& evacuation)

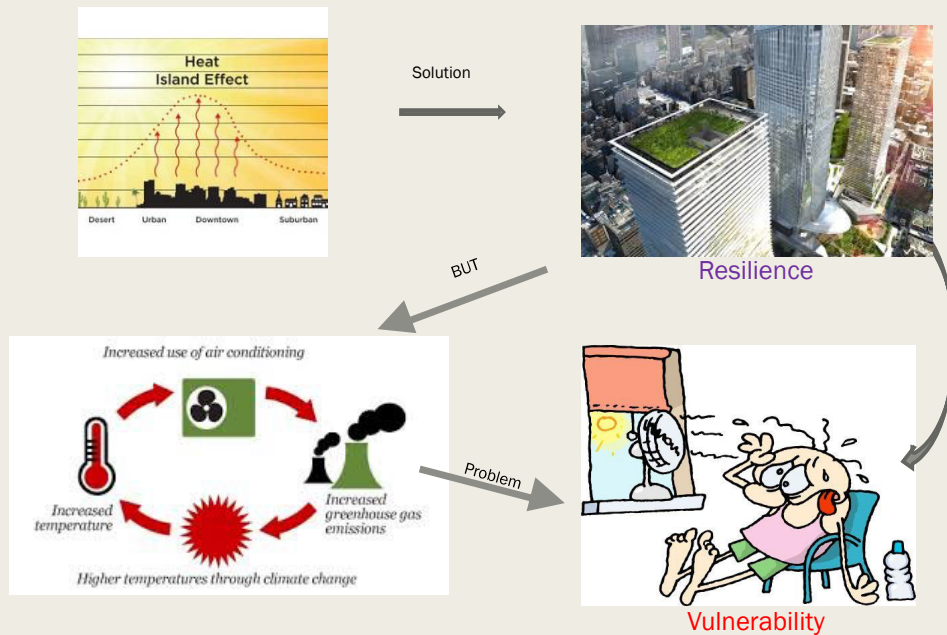Tikopia, Solomon Archipelago
(Population: 1,200)

❖ 1952-53 Typhoons
❖ Famine, 2/3 death per week
❖ People changed their traditional mode of subsistence through adaptation

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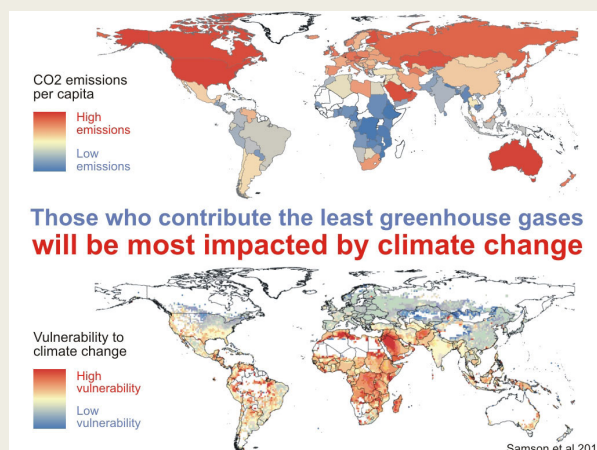# Here is a complex process of adaptation

Abandonment of fallow period

Redefinition of agriculture rights

MAXIMIZATION OF FOOD RESOURCES

Increased Resilience

Crime and thief repression

Diminution of the costs of funerals and weddings rituals

BUT: Resilience of some can create the vulnerability of others!

CLIMATE CHANGE & VULNERABILITY

We need to have a comprehensive and global view of disaster mitigation.

The need to combine vulnerability & resilience

Vulnerability: Focus is on the socio-economic creation of people exposition to risk. It involves a clear, economically and politically induced condition that theorizes the way that people are exposed to a lesser or greater degree of risk.

Resilience: Focus is on natural hazard. Resilience examines the degree to which human action makes it possible for a social– ecological system to survive, revive or ''tip'' (Adger 2000).

Danger of focusing only on resilience:

■ The resilience approach is in danger of a realignment towards interventions that subsumes politics and economics into a neutral realm of ecosystem management, and which depoliticizes the causal processes inherent in putting people at risk.

■ The policy requirements of a vulnerability approach are clear: the need to reduce vulnerability through interventions in the economic and political allocation of resources.

The cause of VULNERABILITY and the solution for RESILIENCE = disaster mitigation

Resilience

Vulnerabilty

Social + Nature Research

Conclusions 1

✳ Disaster is a process not an event but a process.

✳ Disasters happen when a natural hazard strikes vulnerable people. They are socially constructed.

✳ Vulnerability (gender, class, poverty, disability, age, etc.) is specific to the culture, politics, and society that created it. Understanding the cause of vulnerability enables us to mitigate and reduce disaster.

Conclusions 2

✳ Resilience is a concept that focus on increasing the capacity of societies to absorb and *bounce back* after a disaster.

✳ Resilience includes processes of *preparedness, adaptation, sustainability, governance,* and so on.

✳ The study of resilience and vulnerability together achieve both theoretical and practical goals of disaster mitigation.