

Way forward from the science perspective

Building resilience with communities

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- Keio University, Japan

Story 1, how is Japanese aware of
climate change risks?



Itsukushima Shrine

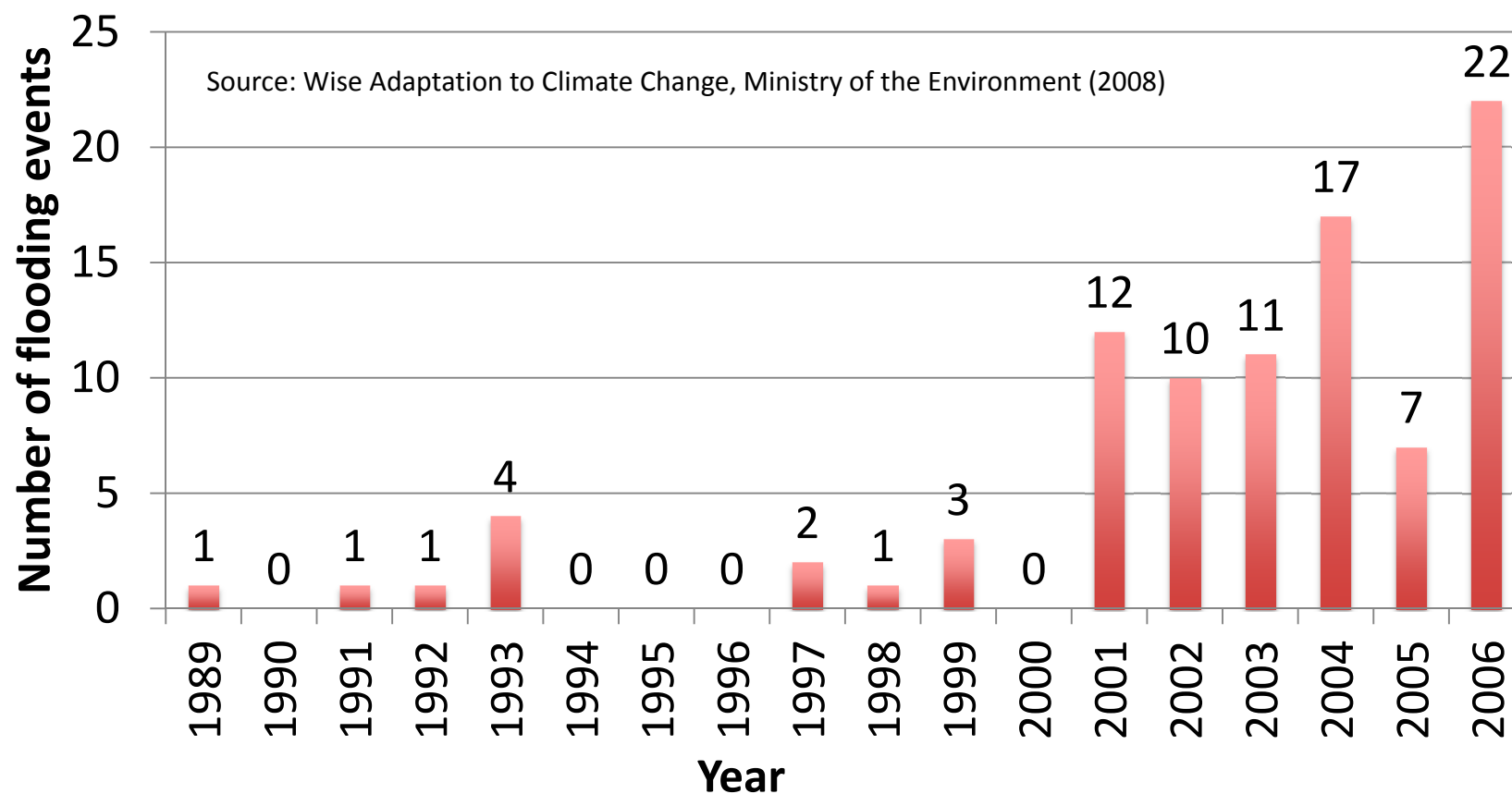
Photo taken during site visit on 01/10/2012



- Itsukushima Shrine is a UNESCO World Heritage site and Japanese National Treasure
- It is located on the island of Itsukushima (also known as Miyajima) in Hiroshima Prefecture, Japan
- The shrine is built on posts sunk into the seabed that allow it to appear, at high tide, as if floating on the sea

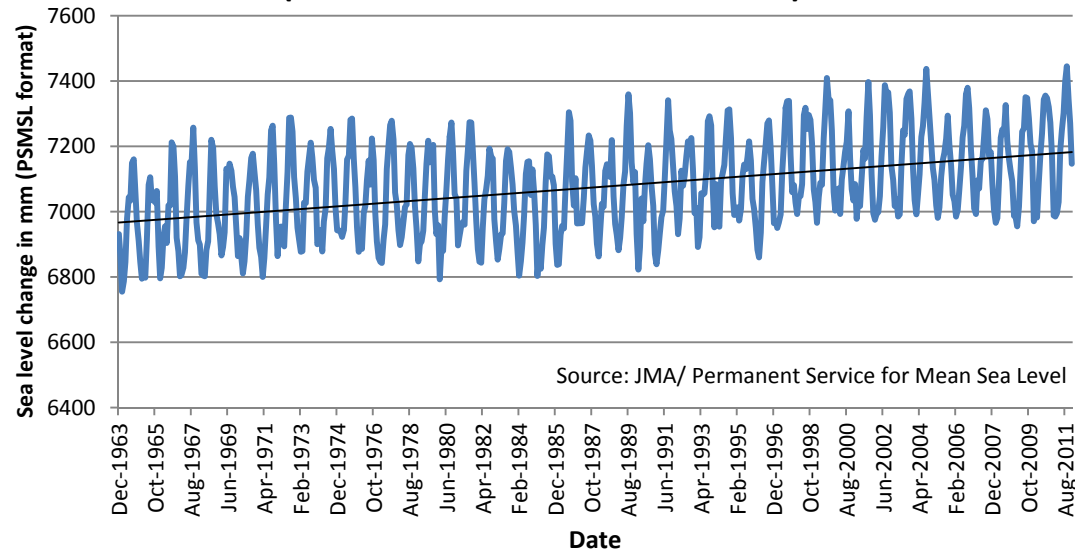
Increasing Flooding Frequencies

Government Flooding Data 1989-2006

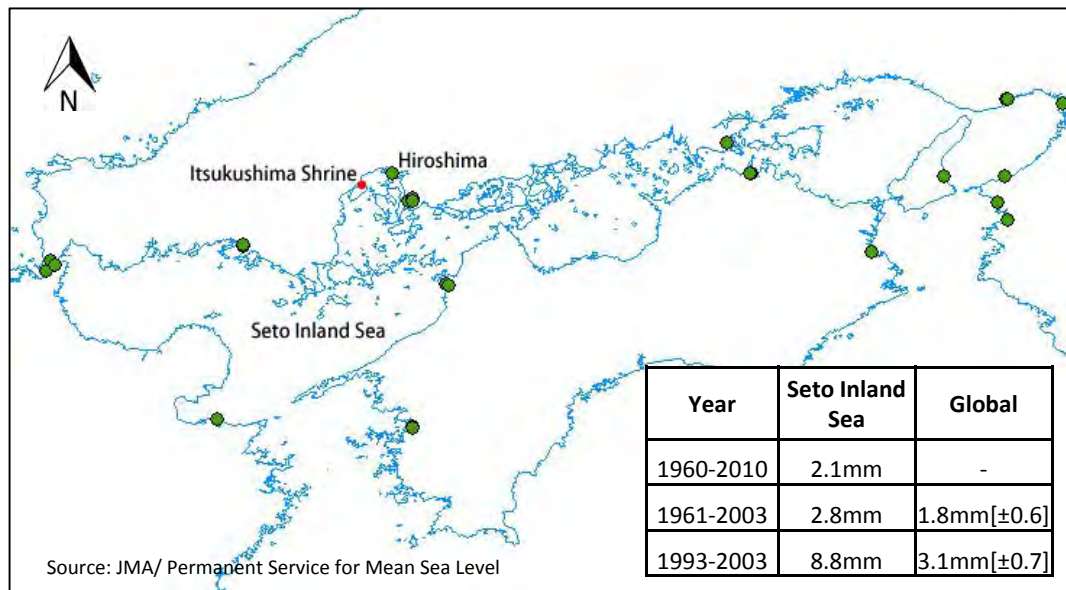


Tide Gauge Data Analysis

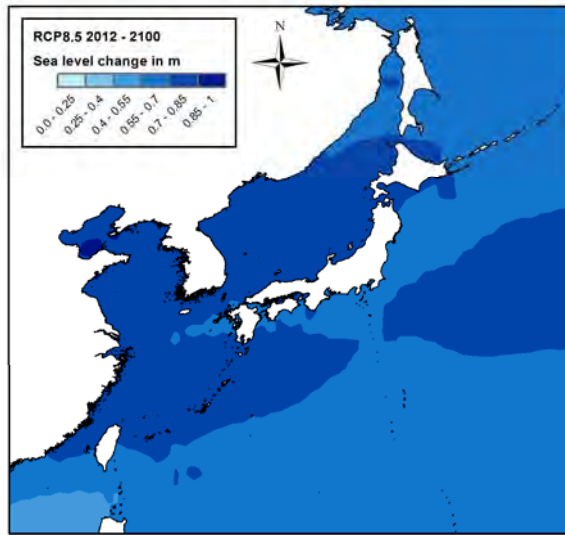
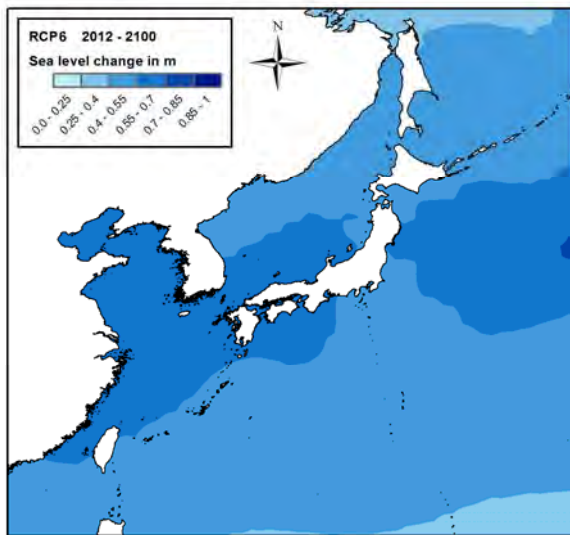
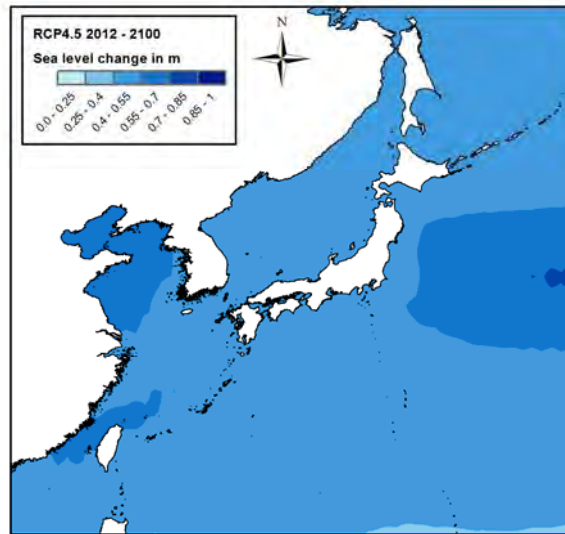
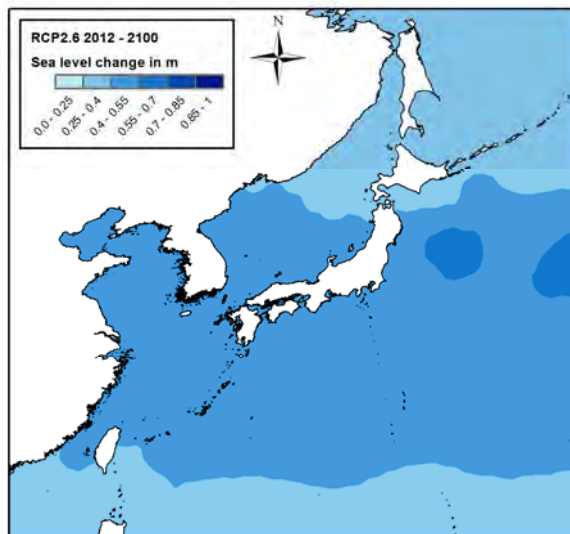
Monthly observed sea level at Hiroshima
(December 1963-December 2011)



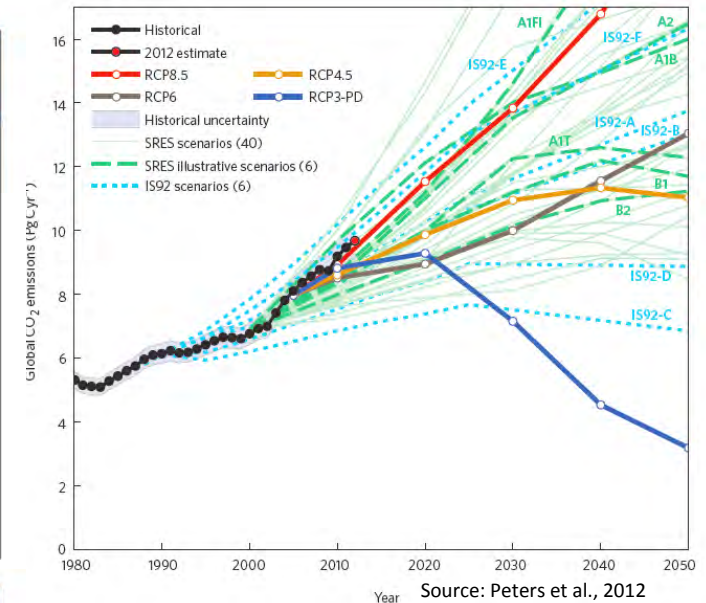
- Sea level at Hiroshima has steadily increased since data recording began in the 1960s (top left)
- Causes include decadal variation (JMA, 2008) and land subsidence (Tokeshi and Yanagi, 2004) making it difficult to attribute recent rise to climate change
- Hiroshima is not an isolated case - sea levels in the Seto Inland Sea rising faster than the global average (bottom left)



Climate Model Data Analysis



Note: Climate model data does not take into account land subsidence or sea-ice melt



- Climate model output shows sea levels around Japan's coasts will rise in the coming decades as a result of global warming (left)
- Latest emissions (above) tracking worst case emissions scenario (RCP8.5)
- From January 1st 2013, no legally binding international climate regulation – future uncertain

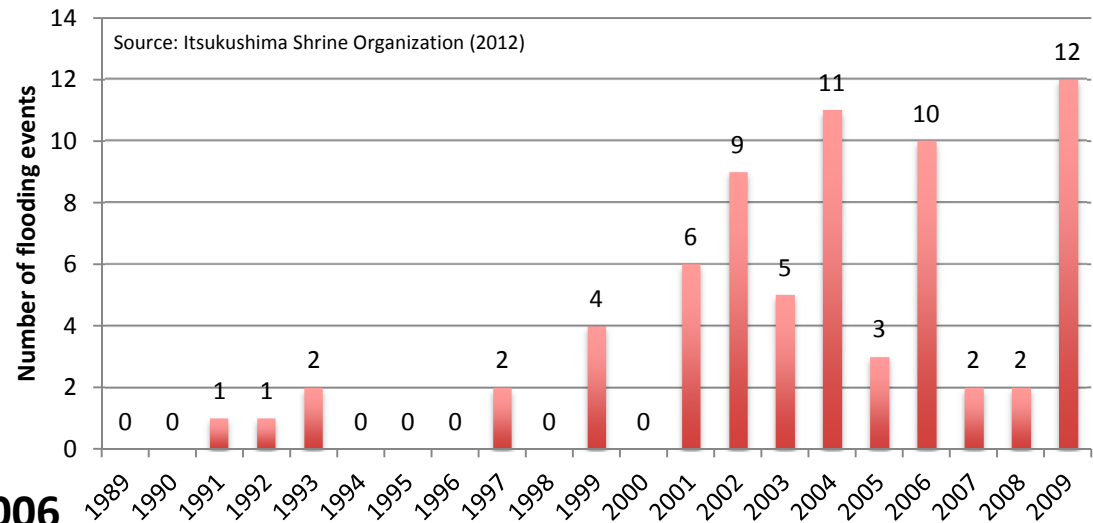
Interviews with Key Stakeholders

Organization	Concerned about climate change?	Access to unbiased climate change information?	Know where to find out about climate change?	Additional information
Itsukushima Shrine Organization	✓	✗	✗	• No standardized tide monitoring system • Climate change not part of management plan, despite UNESCO recommendations • No studies on long-term impacts of increased flooding
National Shrine Organization	N/A	N/A	N/A	• Unable to respond to proposed interview questions - no knowledge of climate change
Prefectural Government	✗	✗	✗	• Shrine's responsibility for site management

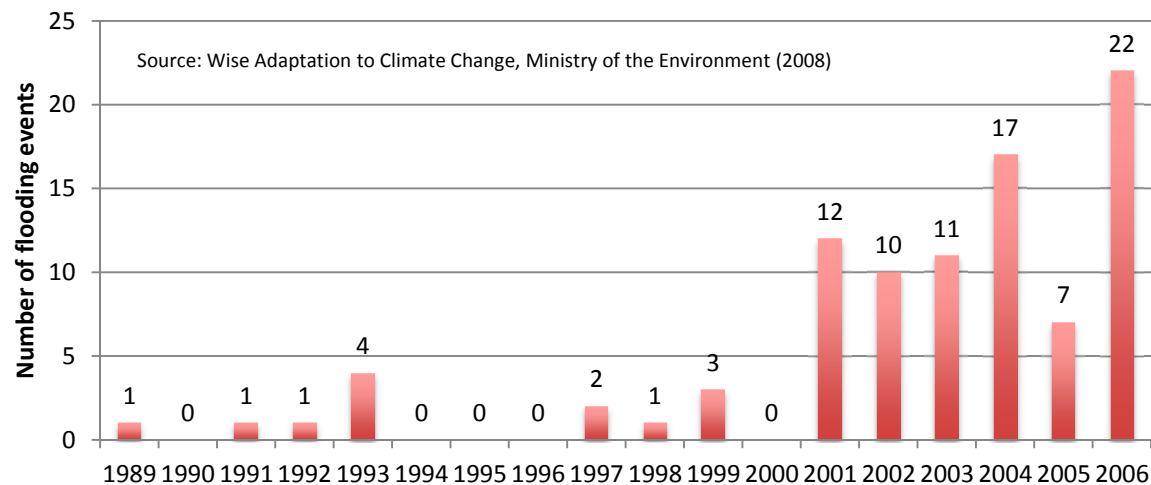


Different Flooding inventories

Shrine Organization Flooding Data 1989-2009



Government Flooding Data 1989-2006



Year

Year

Key points related to story 1

- Awareness on climate change risk is weak at all levels, even in Japan.
- Big knowledge gap between scientific research and implementation on the ground.
- No standardized guidance exist for inventorying loss and damage even within one organization.

Proposal No.1

More on-the-ground programs for improving awareness are needed.

Story 2, how does Japanese
government react to the tsunami
disaster on March 11, 2011

Tsunami Devastated City, Kesennuma, Japan

April 12, 2011



②唐桑・中井地区 (金取漁港～日向貝海岸)

○農地海岸	4箇所
○漁港海岸(市管理)	9箇所
○漁港海岸(県管理)	2箇所
○建設海岸	8箇所
○港湾海岸	1箇所
○治山海岸	1箇所
合計	25箇所

Seawalls are planned over several hundreds kilometers along Sanriku coastal lines. The total budget could over hundreds billions of dollars.

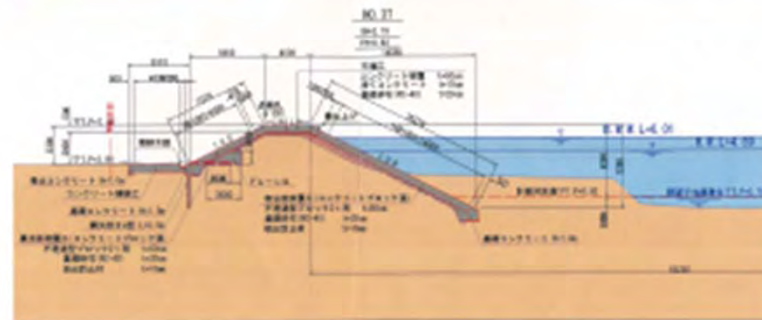
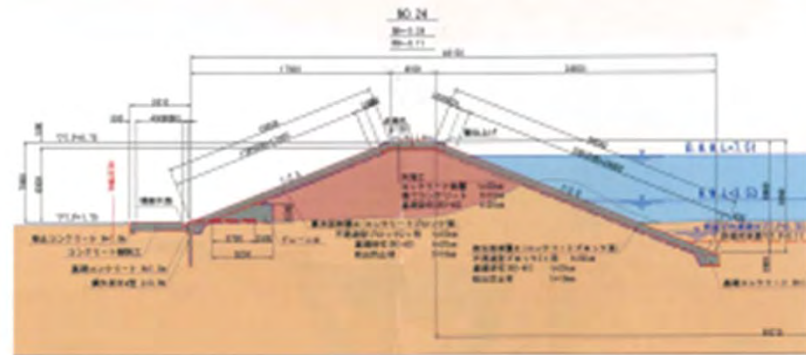
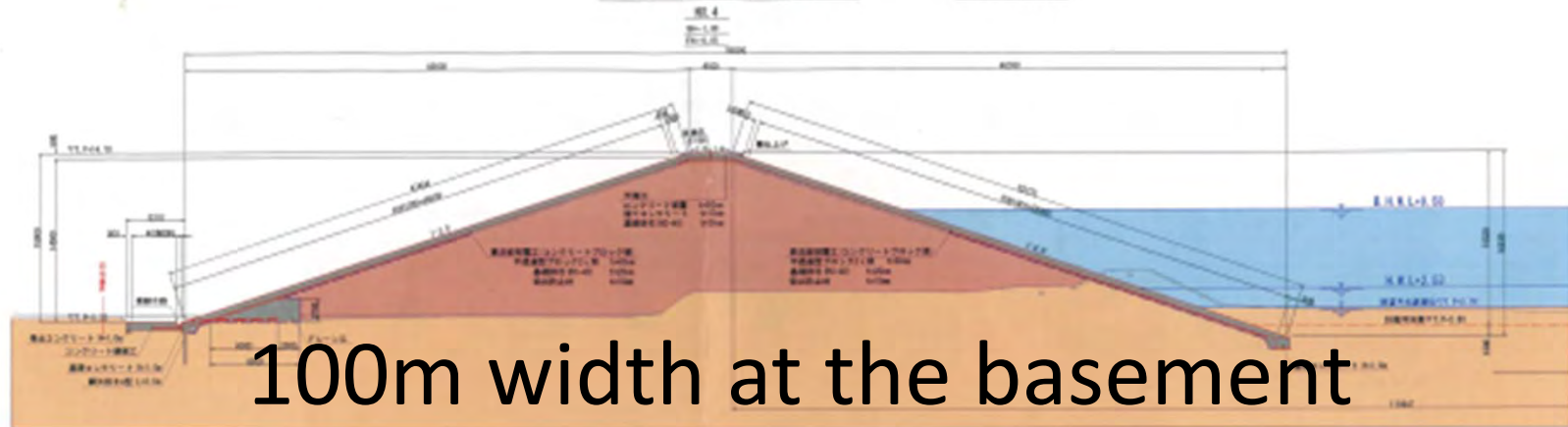


Programs in a district after the tsunami



標準断面図

S=1:200



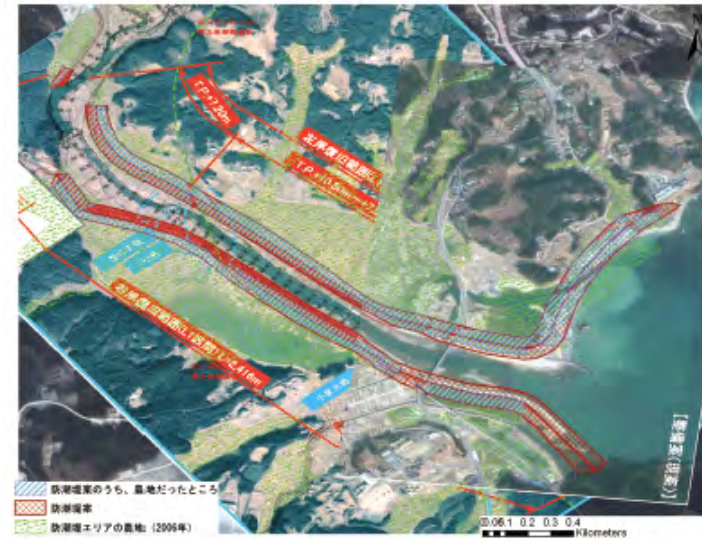
図名	図番	図尺
標準断面図	NO. 4	1:200
断面図	NO. 24	1:200
断面図	NO. 37	1:200
断面図	NO. 40	1:200
断面図	NO. 43	1:200
断面図	NO. 46	1:200
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断面図	NO. 58	1:200
断面図	NO. 61	1:200
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断面図	NO. 76	1:200
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断面図	NO. 97	1:200
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Seawall without Design is also a Problem

Without seawall



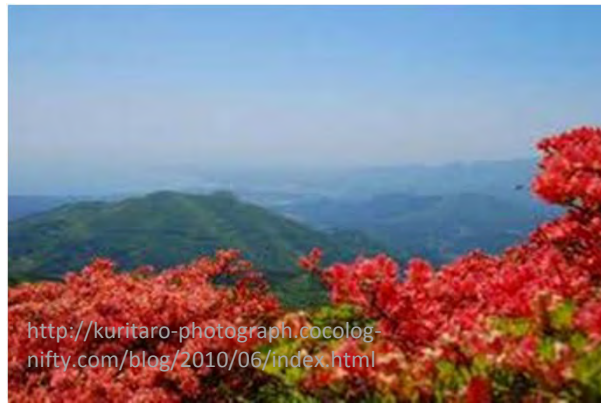
With seawall



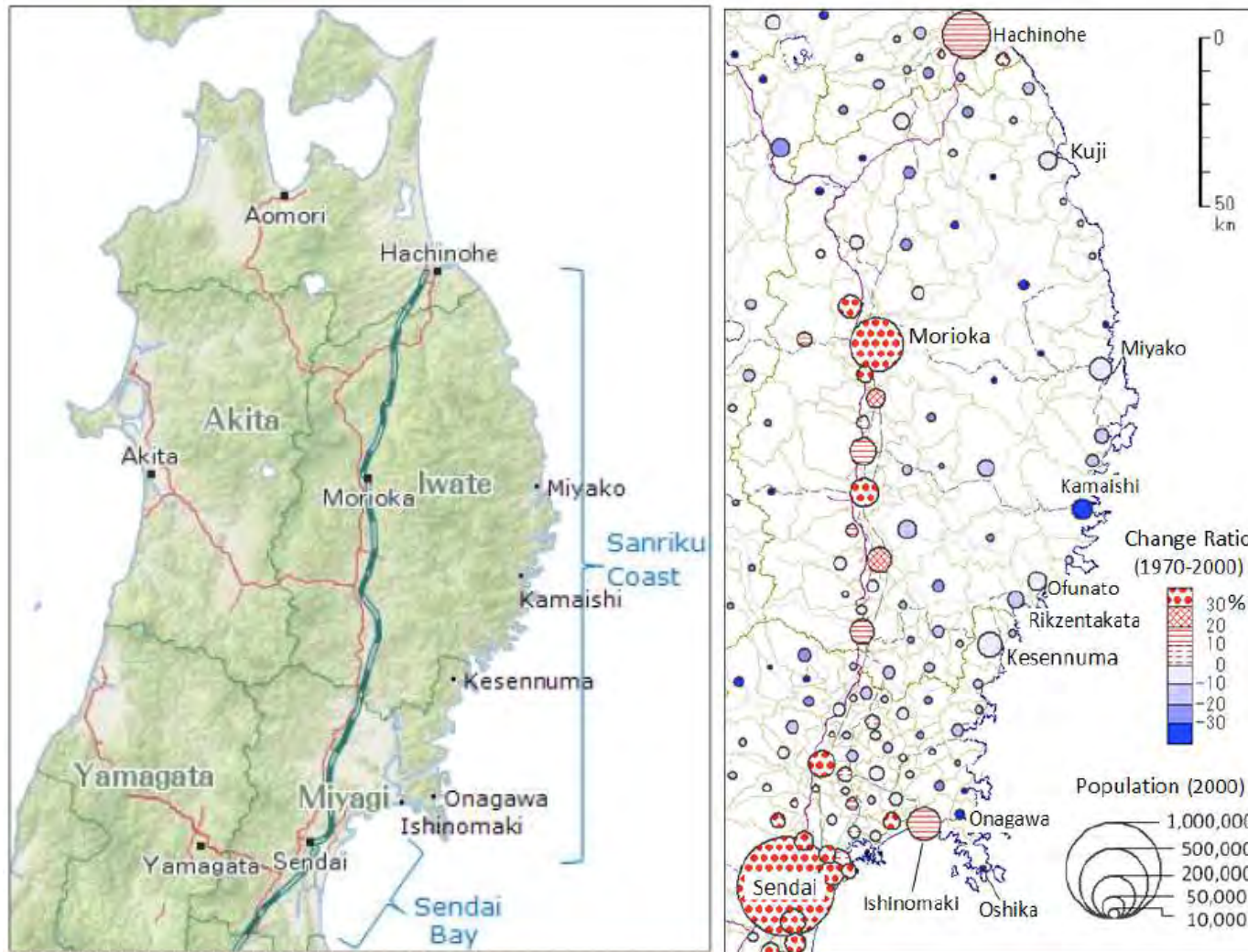


<http://www.pref.miyagi.jp/soshiki/kasen/ka-kg-syokai-2.html>

Maladaptation could bring new loss and damage to next generation



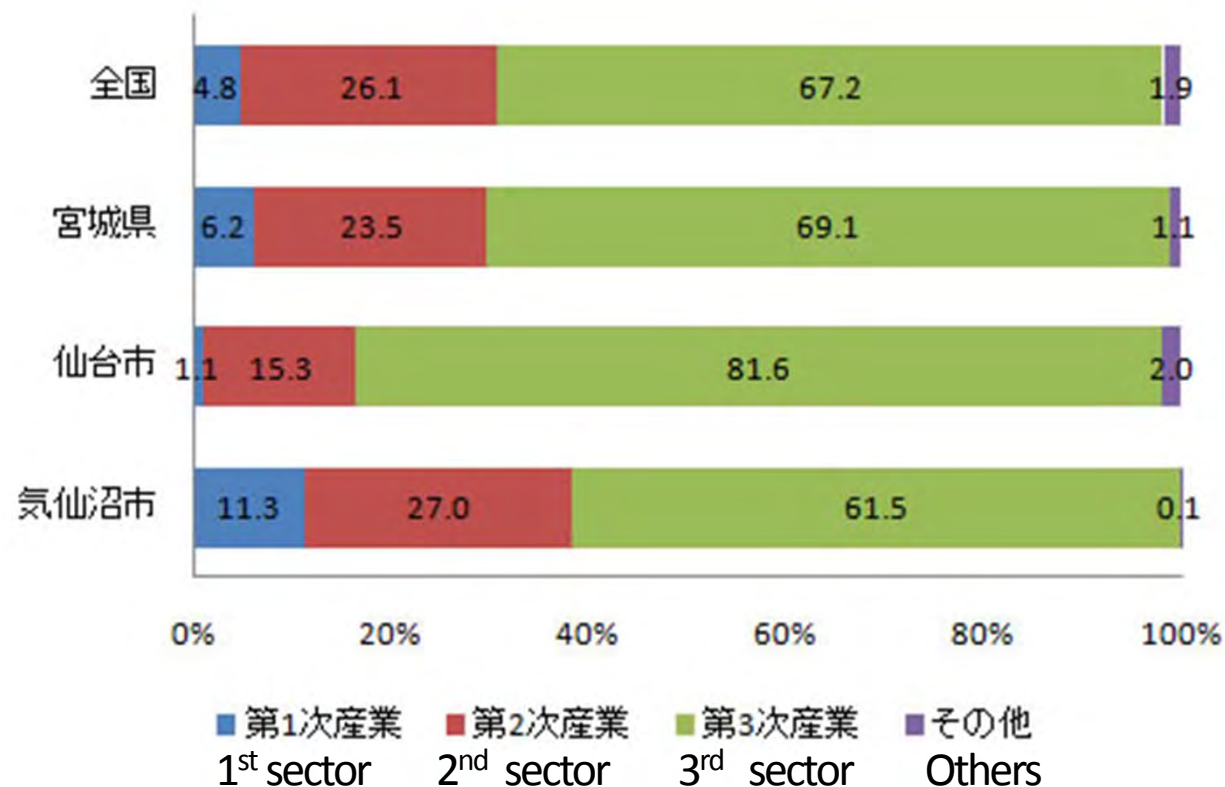
Population has been decreasing since 1970 in Tohoku and Sanriku Coastal Area



source: National Population Census

- Sanriku Coast concentrated in some towns or cities which have major fishing ports.
- Population density is totally lower in comparison with the inland area.
- Since 1970's, the population turned to decrease owing mainly to the reduction of far-sea fishery.
- Population of the most of municipalities decreased from 1970 to 2000, while it increased in 8.7% totally in Tohoku Region.

Industrial Structure of the Area, highly urbanized

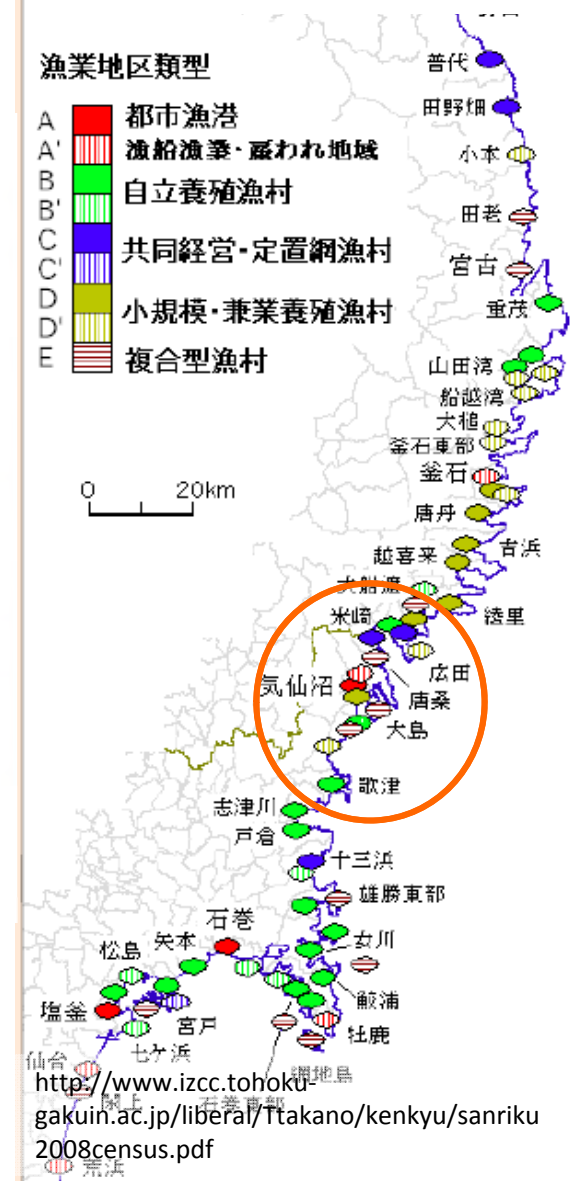


Only 11.3% of labor population is working at first industrial sector.

Source: National census agency.

http://www.buildcon.arch.t.u-tokyo.ac.jp/shinsai/html/miyagi_shikuchoson/kesennuma/sangyo.html

Fishery is the major industry of the region but small scale by aged fishermen mainly.



Key points related to story 2

- Who adapt for whom?
 - Climate is changing. Society is changing, too.
- Instead of engineering adaptation, social resilience must be highly prioritized. Top down allocated budget is prone to cause maladaptation.
- The most barriers is lack of communication among stakeholders, and lack of leadership at community.
 - no one would take the responsibility for unpredictable loss and damage.

Proposal No.2: Scientists should go bottom, listen to communities and foster leaders.

Story 3, Our action

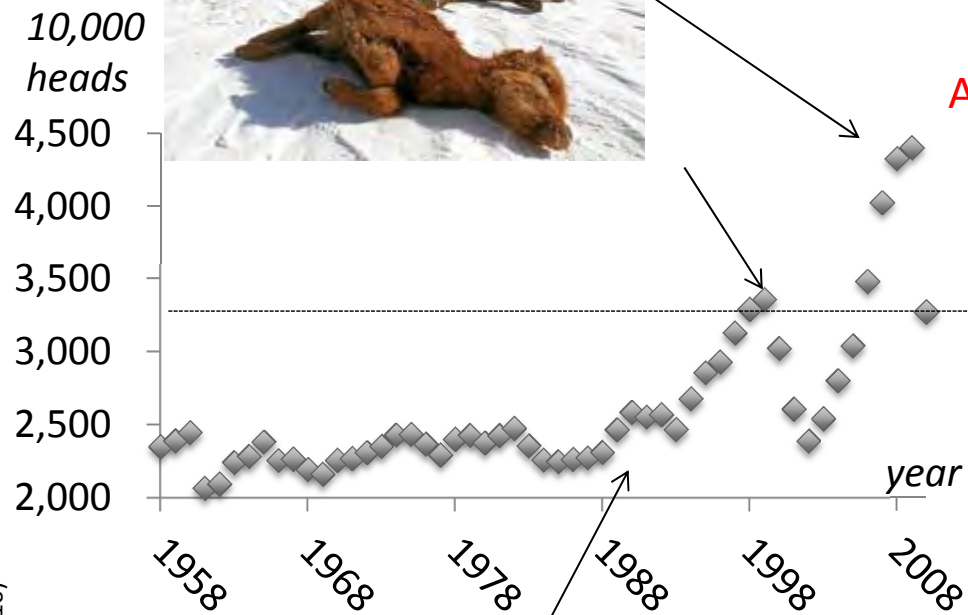
—Integrated early warning system by
Mobile Phone for Mongolian Herders—

Loss and damage of livestock by extreme weathers in Mongolia

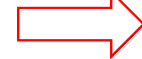
Extremely increased mortality by Abnormal Weather(Zud)



Decision-making from adaptation options in each county(Soem) ex. selling animals before market season



Adaptation



Our Goal

CAP



(Altanbagana and Chuluun, 2010)

Economic Liberalization



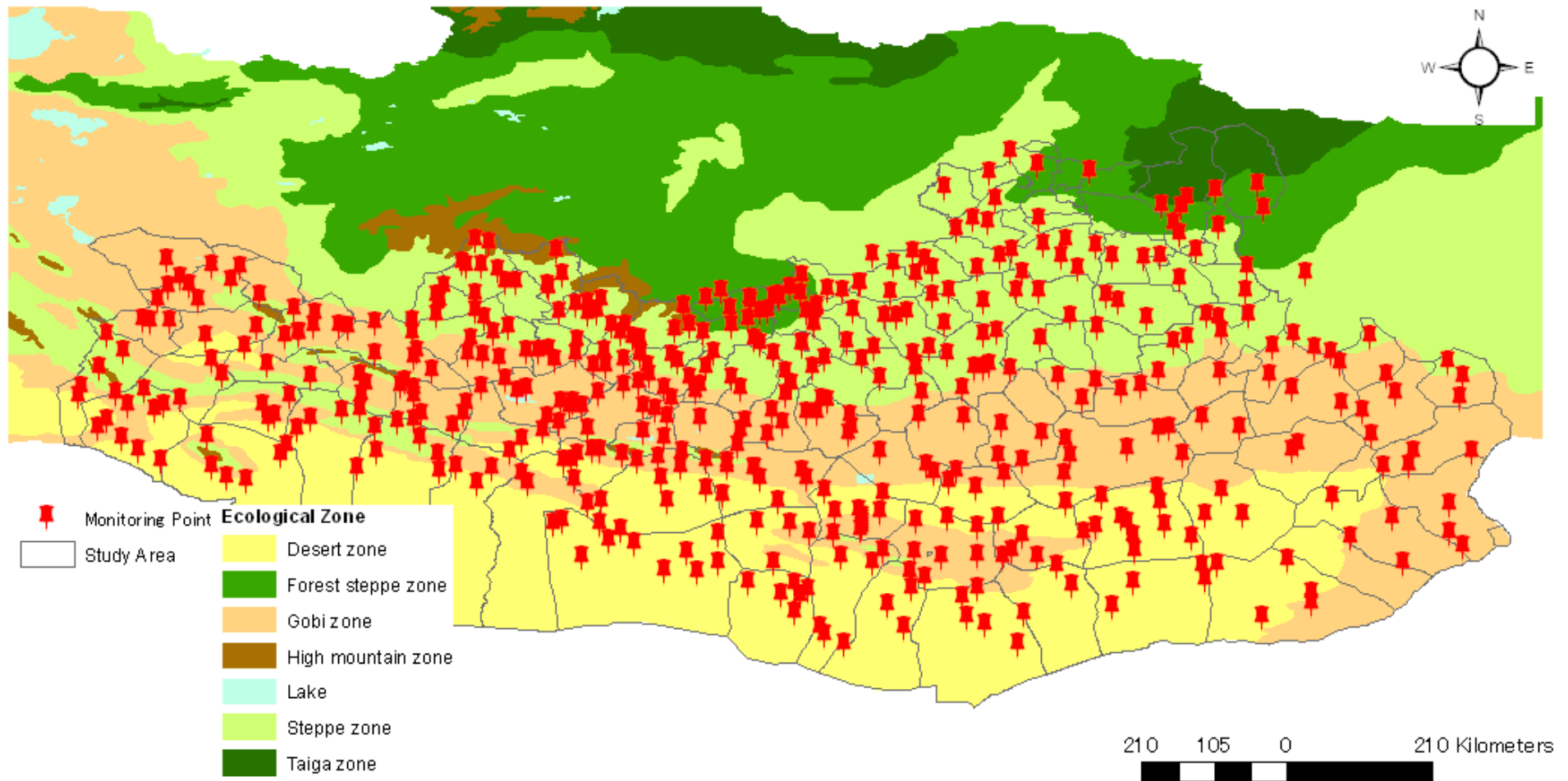
Overgrazing



Return to Carrying Capacity and Stable Grazing



Scientific observation and data resources exist in Mongolia



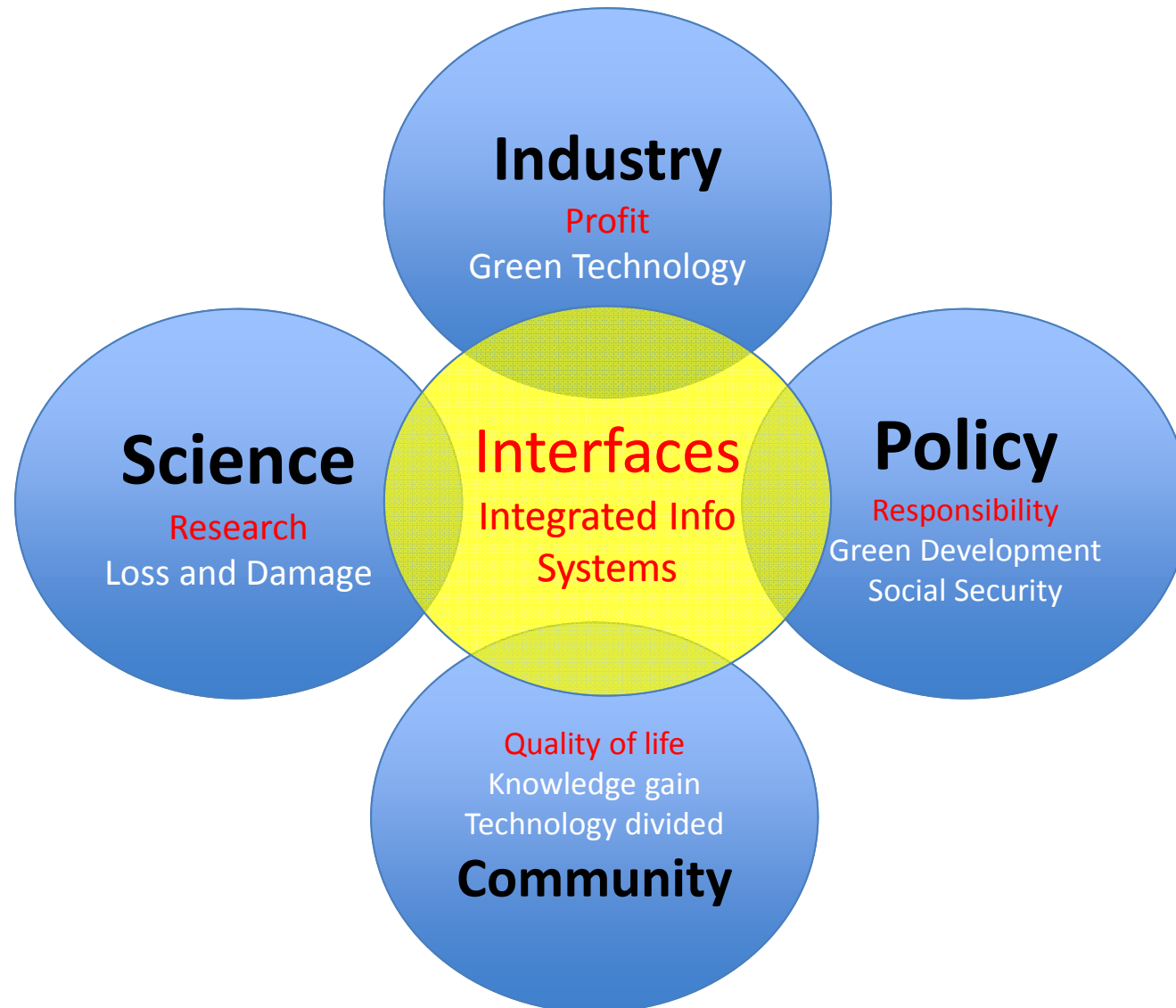
LEWS data

<<http://glews.tamu.edu/Mongolia?>>

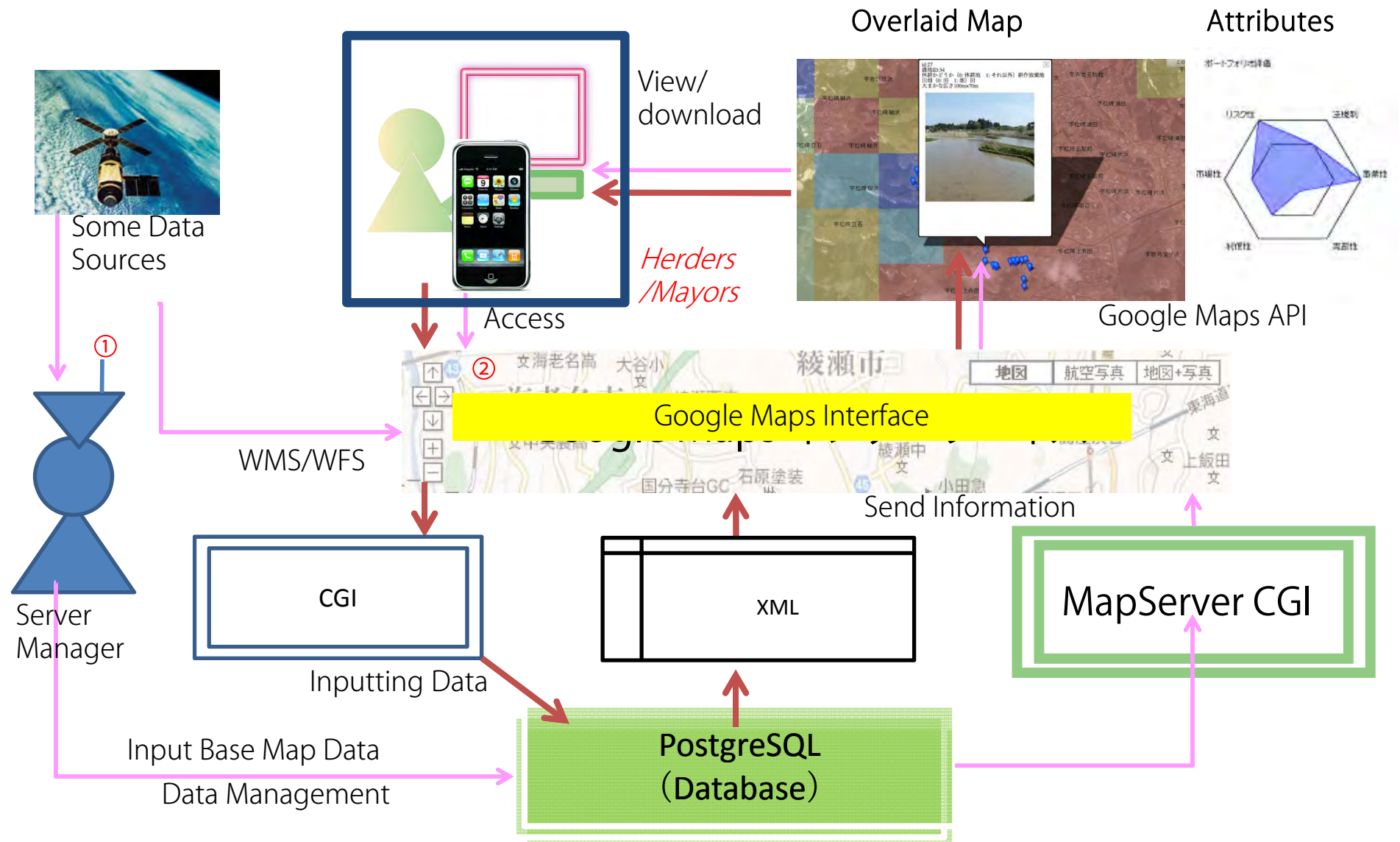
8 Aimags / 22 Aimags

131 Sums / 328 Soems

Early warning system as interface to bridge gaps between science, policy, industry and community



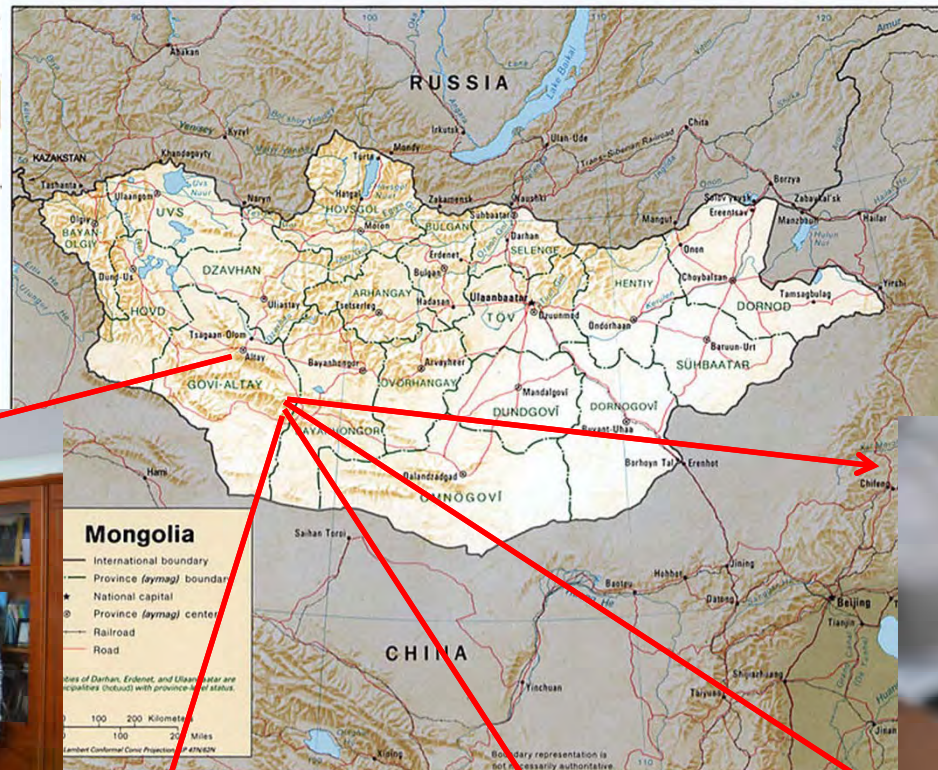
Integrated knowledge sharing and delivery to local communities



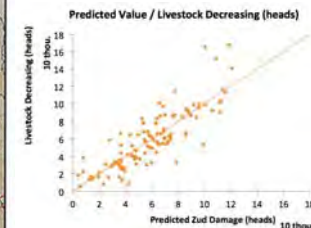
Implementation with the people at bottom



Provincial Level
(Alti-Gobi)



National Level



Local Level (Biger
Soem)



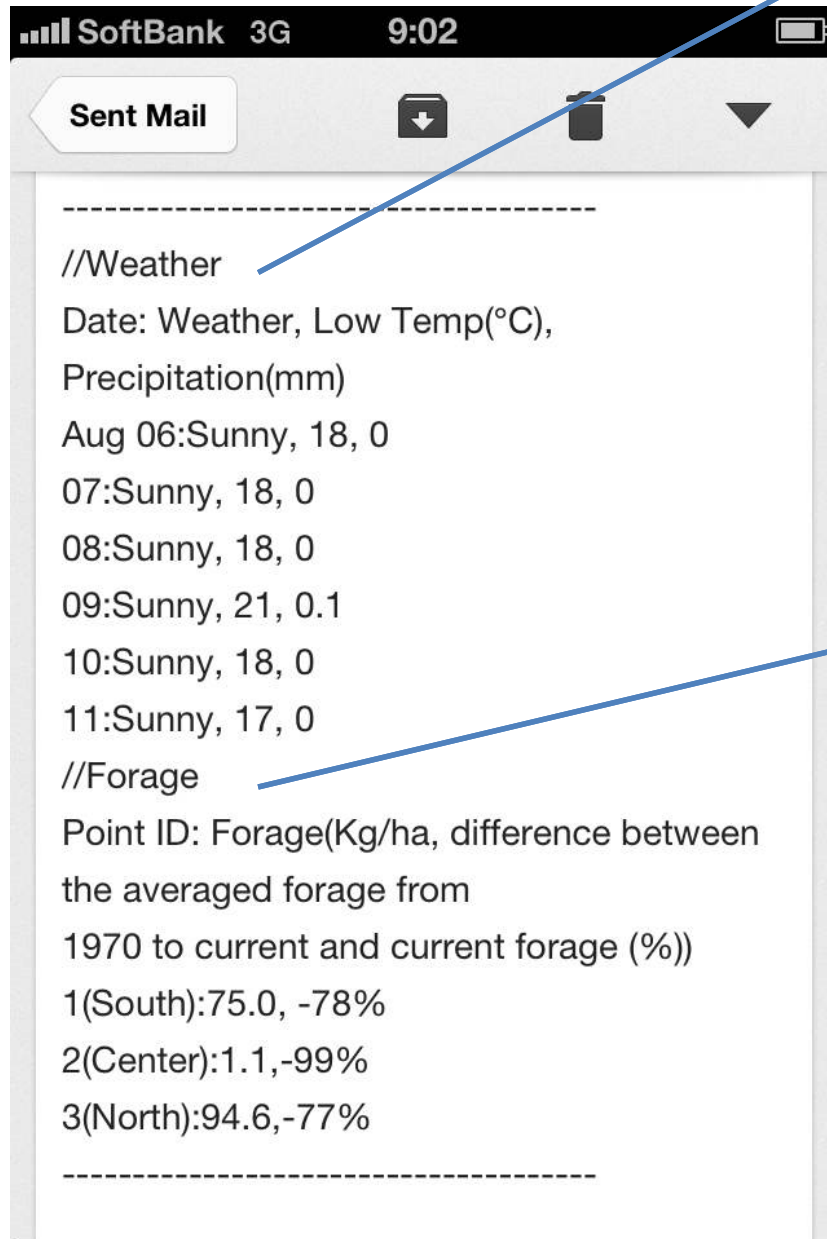
Awareness training



SMS to herders



Message Contents



Data Name	Weekly Weather
Data Contents	Daily Weather, Minimum Temperature(°C) , Precipitation(mm)
Data Source	the Norwegian Meteorological Institute and the Norwegian Broadcasting Corporation (http://www.yr.no/place/Mongolia/)
Data Level	Sum Level
Data Name	Daily Forage
Data Contents	Forage (kg/ha), Rate of Change between the averaged forage from 1970 to current and current forage (%)
Data Source	Texas A&M University, and National Agency for Meteorology and Environment Monitoring (http://glews.tamu.edu/Mongolia)
Data Level	Point (3 points in Biger Sum)

This message sends to herder's mobile phone weekly at present.

Key points related story 3

- Nomadic life in Mongolia is one of the autonomous adaptation wisdom, but intolerant to extremes.
- There exists a lot of data and information but interoperability is very bad.
- Most of climatic knowledge is stayed as journal papers and organizational reports.
 - It is rare to be delivered to end users.
 - The knowledge is not tolerant to be assessed by end-users in spatial and temporal accuracy.

Proposal No.3

Information and knowledge must be shared not only for researchers but implemented for end-users.

The Way forward



Social Resilience is Key

Facts on Loss and Damage

1. Disasters happen every where, nothing with the development level of countries.
2. People in developing countries might be more tolerant with indigenous knowledge than urbanized people in developed countries.
3. No boundaries of disasters between nature induced, manmade, or climate change induced. No boundaries of loss and damage induced by climate change, climate change with adaptation, or climate change with no adaptation.
4. Because of the above, it's difficult to claim for compensation from developed countries.

Loss and Damage is an Issue of Equity

- *Loss and damage needs to be considered in the context of lost opportunities to achieve sustainable development.*
- *The countries most vulnerable to loss and damage are not responsible for the climate change that is destroying lives and livelihoods.*
- *Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.*

Loss and damage from climate change: the cost for poor people in developing countries, Act!onaid

Opportunities can only be activated by people themselves. Aids from outsiders, budget top down allocated could undermine the capacity of people themselves from the perspective of sustainability.

Loss and Damage could be forces of the evolution of human society

- Some part of loss and damage is unavoidable because there will be always unprecedented events. We must learn to live with risk.
- The reduction of loss and damage must be realized by the transformation of social systems, our mindsets and our values.

From

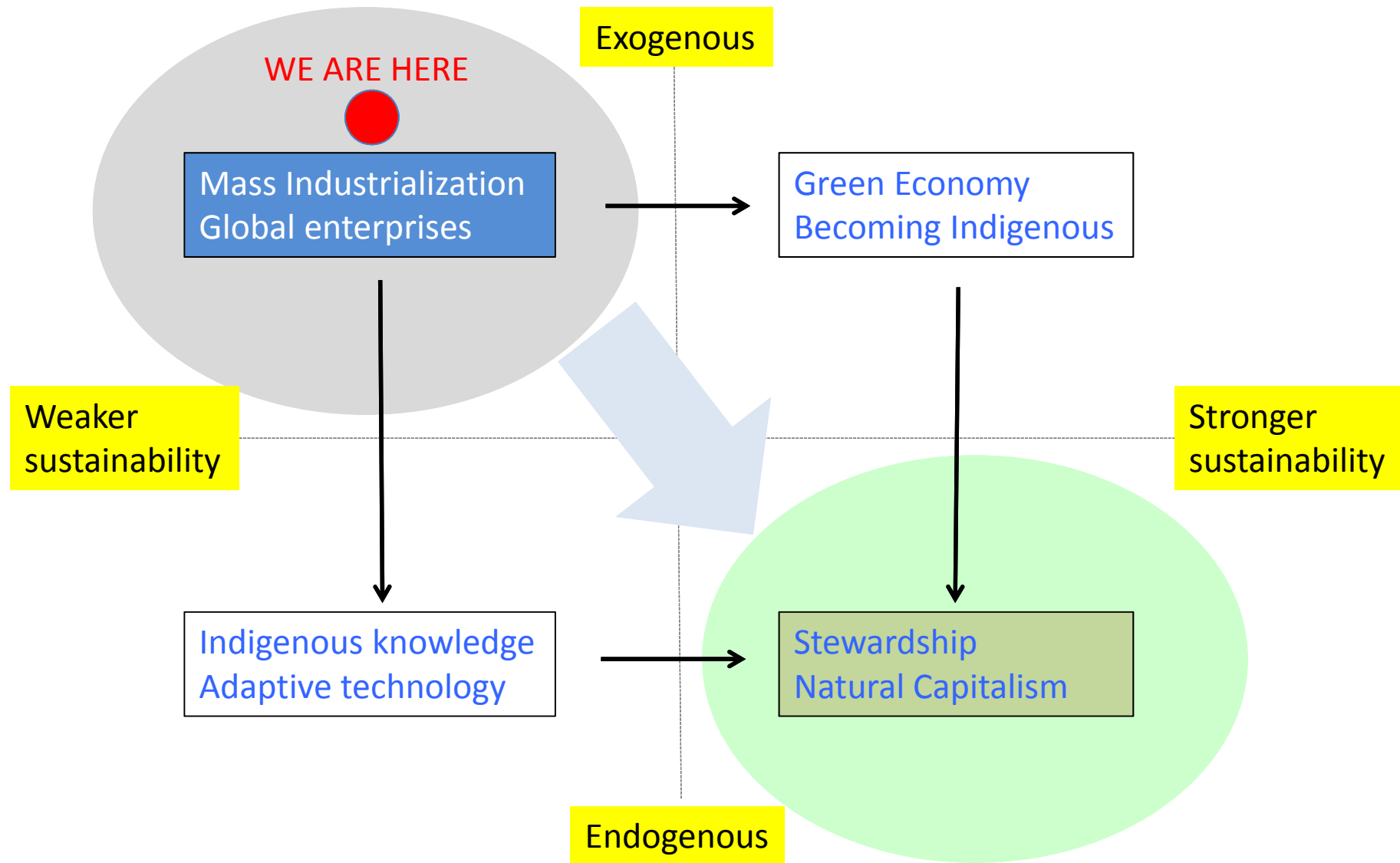


To

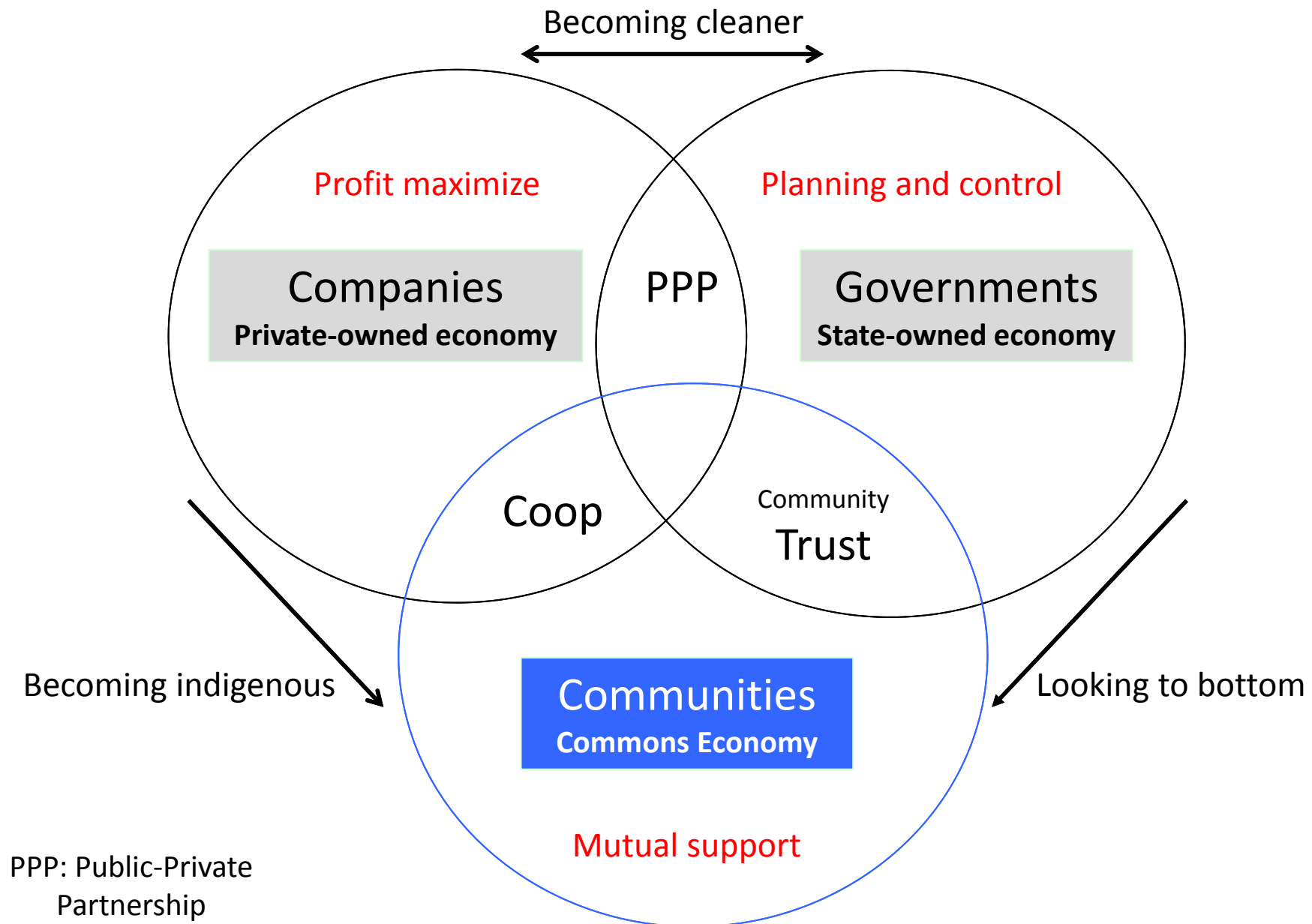
- Over-populated
- Depopulated
- Over-centralized
- Over-industrialized

- Well-distributed
- Autonomous
- Self-organized
- Adaptive

The way forward: Building resiliency with communities



Communal Sustainable Development Model



In lieu of conclusion

- *We cannot solve our problems with the same thinking we used when we created them.*

– Albert Einstein

- *We can bring the best parts forward into our best future. But only if we see how thoroughly our world differs from the past.*

– Douglas K. Smith, “On value and values”

Announcement

The fourth International Symposium on
Environmental Innovation

Embracing Change: Building Resilience with Communities

Jan 15 to 16, 2014

Keio University and IGES
at
Hiyoshi Campus, Keio University, Yokohama City