

# *Sustainable development and mainstream policy*

Chirapol Sintunawa

Faculty of Environment and Resource Studies, Mahidol University  
For  
The Club of Vienna, Club of Rome and Austrian ministry of Energy  
September 10, 2014



*Sugar cane  
plantation*



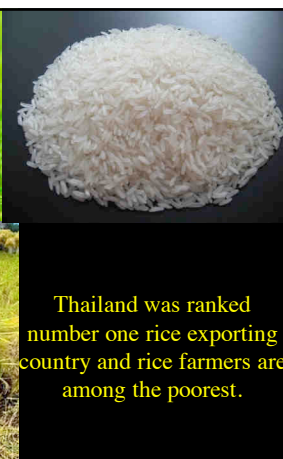
*Rice plantation for local  
consumption and exports*



*Water Buffalo  
with paddy  
production*



*Paddy  
production is  
labor intensive  
and covering  
one-third  
country  
agricultural  
areas*



Thailand was ranked  
number one rice exporting  
country and rice farmers are  
among the poorest.



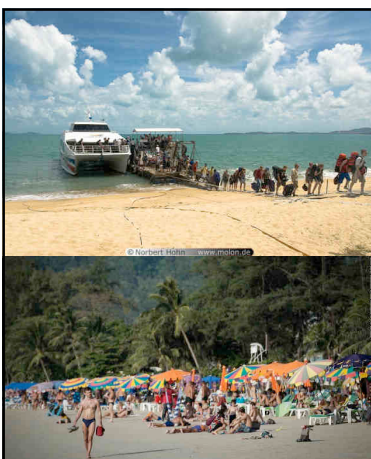
Fruits and vegetables are increasingly exported



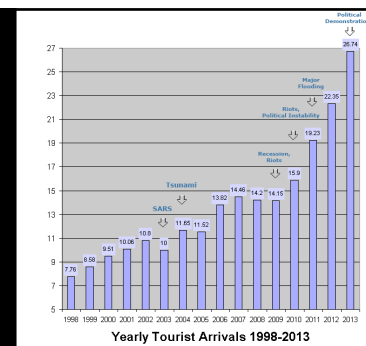
Food are over supply all year round



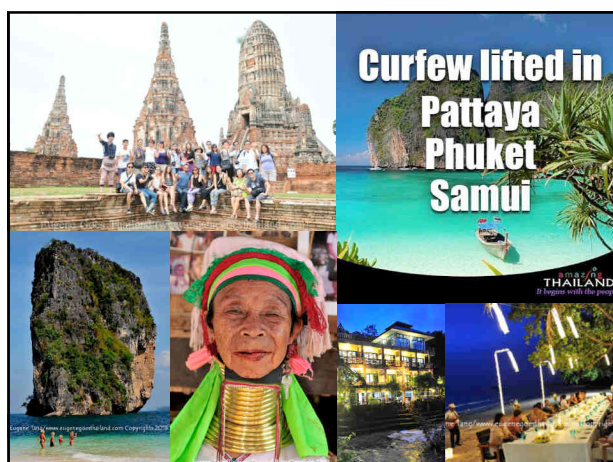
Thailand's Suvarnabhumi airport welcomes more international travellers



Tourism is number one currency earning. Average tourist arrival was 2 millions per month.



If the year 2000 is taken as an easy benchmark with 10 million visitors at the time, Thailand reached 26.74 million visitors in 2013, an increase of 167 %.



## Curfew lifted in Pattaya Phuket Samui

### Background

- 1980 – 2010 : 105 natural disasters in Thailand
- 64 million people affected and 12,000 deaths since 1980
- \$194,282,000 USD cost every year on average
- 48% of surveyed small & medium sized enterprises (SMEs) were affected by disaster at least once per year
- Avg. cost per SME per event: \$115,441 USD
- Avg. recovery time: 2 months
- 86% of respondents have never had disaster risk management training (DRM)
- 72% of respondents stated they would use DRM training if available

Source: Thai Government's Disaster Preparedness of Small and Medium Sized Enterprises in Thailand, 2013

### Who was surveyed?

- 429 SMEs total
- SMEs from 5 geographically distinct regions of Thailand
  - Ubon Ratchathani
  - Chiang Rai
  - Phitsanulok
  - Songkhla (Hat Yai)
  - Phuket
  - Phra Nakhon Sri Ayutthaya
- 69.6% female, 30.3% male
- 77% employees, 23% owners
- 76% small, 23.9% medium businesses

- Types of businesses surveyed:
- Hotels & Restaurants 42.4%
  - Transport & Communication 21.9%
  - Food & Beverage 17.7%
  - Metal Products 6.3%
  - Rubber & Plastics 5.8%
  - Machinery & Electronics 3.5%
  - TV & Communications 2.3%

Source: Thai Government's Disaster Preparedness of Small and Medium Sized Enterprises in Thailand, 2013

### What's happening?

Disaster risk is increasing in Thailand and throughout ASEAN

- Increasing number & intensity of natural disasters (hazards)
  - Result of climate change
- Increased vulnerability to natural disasters
  - Result of environmental degradation & lack of preparedness
- Increased exposure to natural disaster
  - Result of higher population & more development in hazard prone regions

$$\text{Disaster Risk} = \text{Hazard} \times \text{Exposure} \times \text{Vulnerability}$$

Source: Thai Government's Disaster Preparedness of Small and Medium Sized Enterprises in Thailand, 2013

### Effects on SMEs by type

Chart 2: Percentage of industry impacted by a natural disaster (2002-2012)

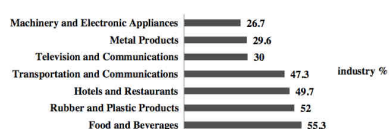
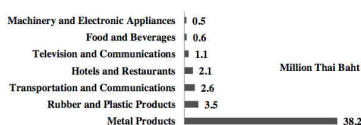


Chart 3: Average loss/damage costs per event by industry (2002-2012)



Source: Thai Government's Disaster Preparedness of Small and Medium Sized Enterprises in Thailand, 2013

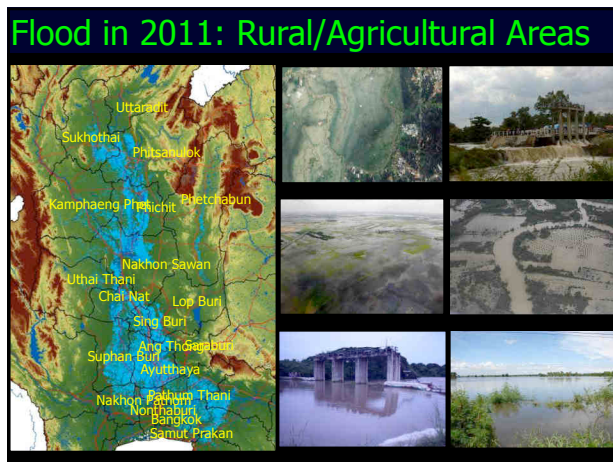
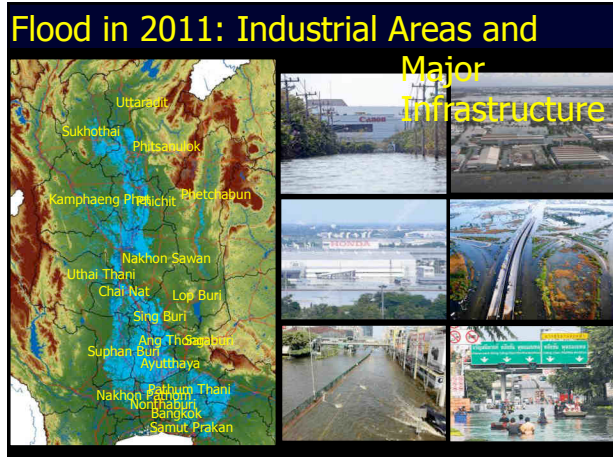
### Types of Natural Disasters

Table 3: Impact on SMEs by type of natural disaster and degree of impact (2002-2012)

|                  | % of SMEs impacted | Degree of Impact (% of SMEs) |      |          |      |           |
|------------------|--------------------|------------------------------|------|----------|------|-----------|
|                  |                    | Very low                     | Low  | Moderate | High | Very High |
| Inland Flooding  | 71.8               | 3.4                          | 11.5 | 24.3     | 47.3 | 13.5      |
| Earthquake       | 27.7               | 60.0                         | 21.8 | 14.5     | 3.6  | -         |
| Tsunami          | 20.4               | 45.2                         | 26.2 | 16.7     | 9.5  | 2.4       |
| Cyclone          | 18.9               | 46.2                         | 17.9 | 23.1     | 10.3 | 2.6       |
| Drought          | 15.5               | 62.5                         | 9.4  | 18.8     | 6.3  | 3.1       |
| Severe Storm     | 15.0               | 74.2                         | 6.5  | 19.4     | -    | -         |
| Forest Fire      | 13.7               | 89.3                         | 7.1  | -        | 3.6  | -         |
| Landslide        | 13.6               | 82.1                         | 14.3 | 3.6      | -    | -         |
| Flash flooding   | 13.6               | 75.0                         | 10.7 | -        | 14.3 | -         |
| Coastal Flooding | 13.1               | 74.1                         | 14.8 | 7.4      | 3.7  | -         |

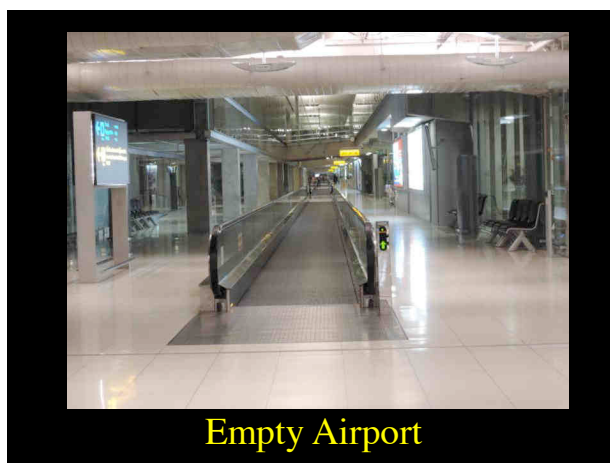
- Inland flooding is by far the most common and most impactful natural disaster in Thailand.
- Types of disaster concerns vary greatly by region.

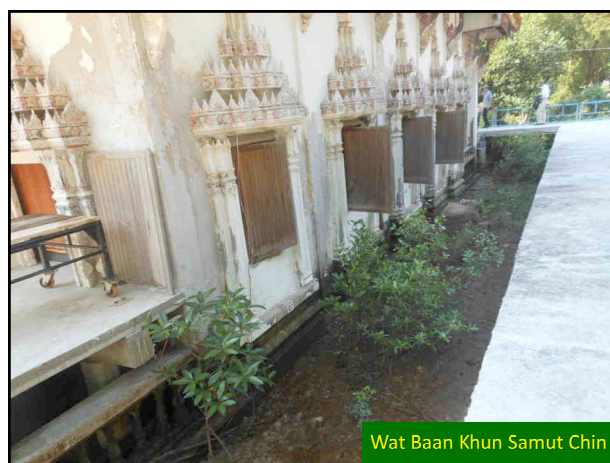
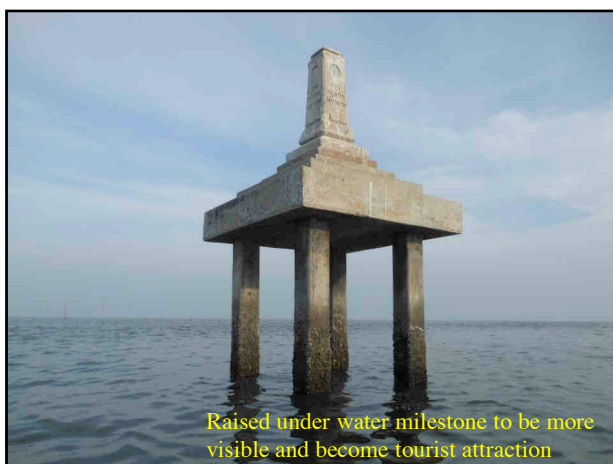
Source: Thai Government's Disaster Preparedness of Small and Medium Sized Enterprises in Thailand, 2013

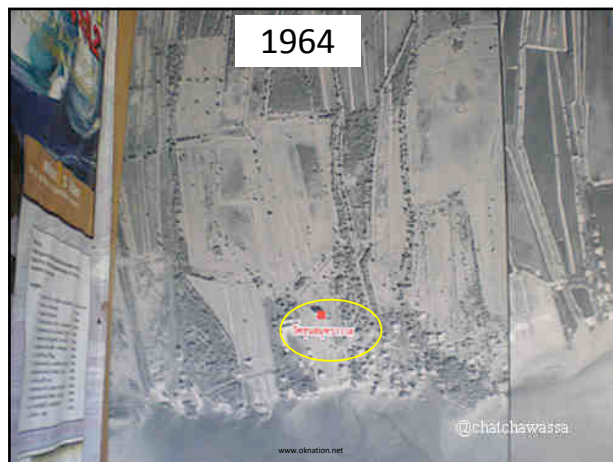
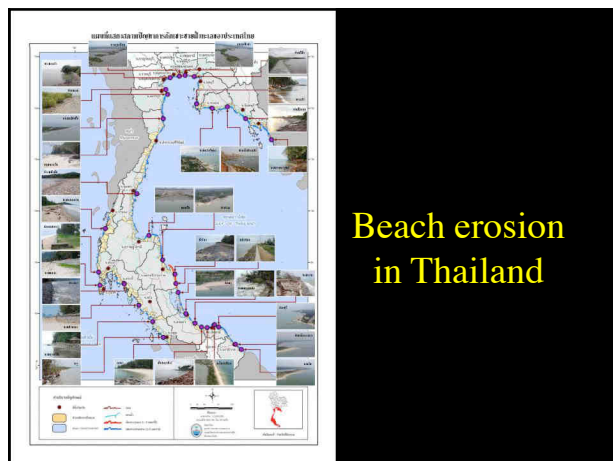




Empty shelves at almost every store during flooded period.

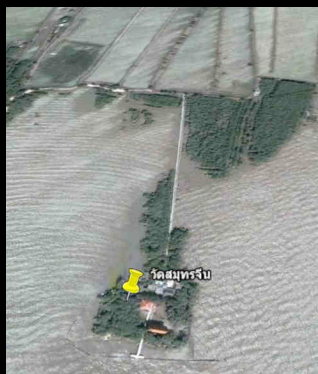






### Where is Wat Baan Khun Samut Chin?

- 30 km from Bangkok
- Accessible by boat and walking only
- Concrete bridge connects it to land
- Now an island in the ocean 500 meters off shore

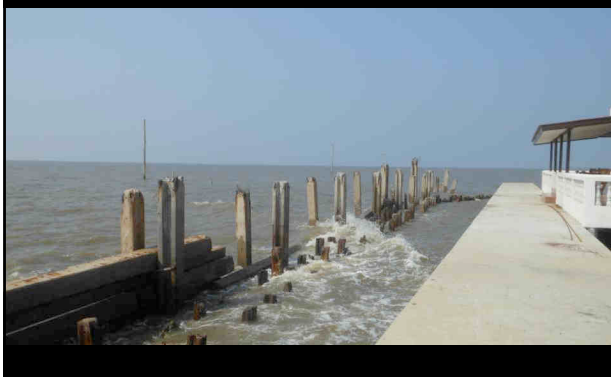


<http://chonburi33.com>

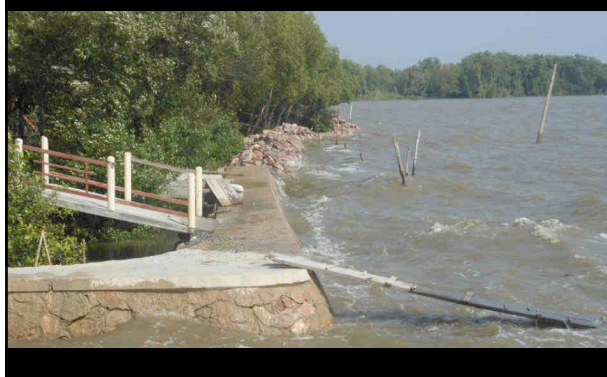
The temple is now two meters above sea level



Destroying water retention walls.



Land is eroding, sea is rising



### Why is land eroding?



- River dammed upstream (sediment cannot reach coast)
- Mangrove forests destroyed
- Increasing storms and higher waves

Submerged electricity poles show where town once was





Living with continuous adaptation.



- Gulf of Thailand is projected to be one of the areas of the world that will see the largest increase in sea level.
- Thai coast has already lost 60km to sea level rise

### How quickly is Khun Samut Chin's coastline changing?

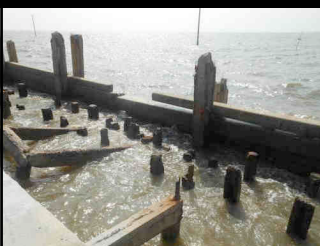


- Lost 1 kilometer and badly damaged an additional 4 kilometers in 2 generations
- Moo 8 (177 houses) totally lost already.



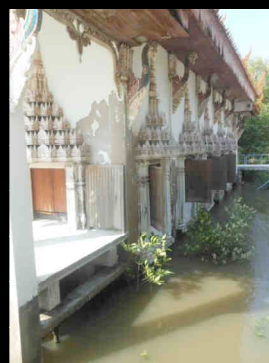
- Village's population has decreased 50%
- Many residents have moved their homes further from sea 10-12 times in their lifetimes
- Monsoon waves have doubled in size in 20 years

### Initial reactions to rising water



- Started building dams in 1994
- Earth, stone, wood
- None worked well
- School is in its 3<sup>rd</sup> location
- Mangroves could not survive higher waves

### Temple floor raised



- Floor of temple was raised up 1.5 meters
- Windows and door now shorter
- Concrete walkway to temple built

November 2013



Raising the floor  
shrunk  
doorways at Wat  
Baan Khun  
Samut Chin

November 2013



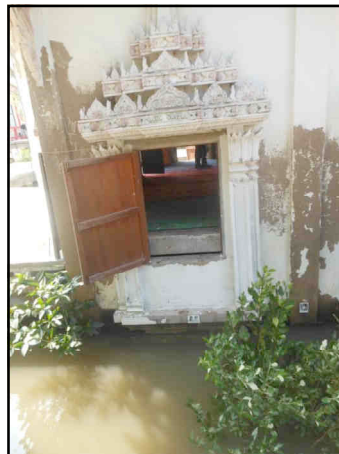
Raising the floor shrunk doorways at Wat Baan Khun Samut Chin

November 2013



Raising the floor  
shrunk doorways at  
Wat Baan Khun  
Samut Chin

November 2013

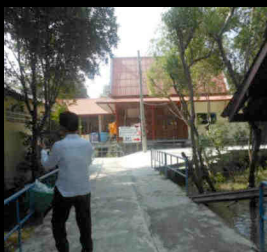


Windows  
shrunk as well



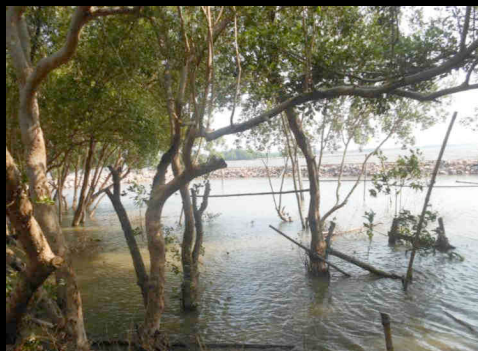
The temple is still the heart of the  
community

## Current Adaptation Strategies



- Putting homes and paths on stilts
- Promoting ecotourism to generate money to pay for stilts and other improvements

## Mangroves can reduce waves, and waves can also reduce mangroves



## What does the future hold?



- Sea level is still rising
- Storms are getting worse
- Polluted water endangers villagers' fishing livelihood

## Increasing construction materials for never ending adaptation.



## Fighting Climate Change in affected areas



## Political up rising in 2009-2014



Political changes during 2009-2014



Changes in 2009-2014

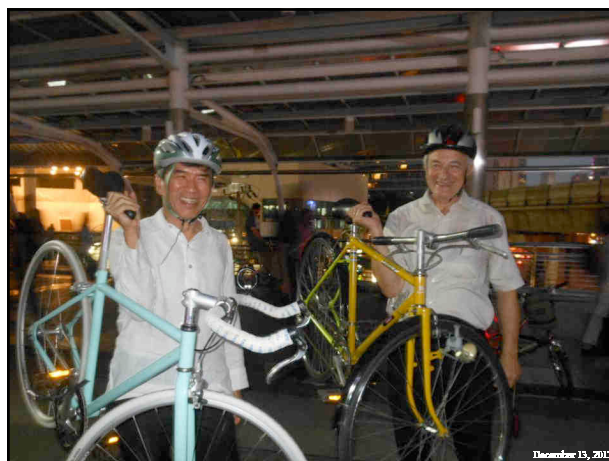


Momentum of change is being directed toward better mangement



*Accelerating  
transformations  
and  
adaptations*

December 13, 2013



December 13, 2013



## Government adaptation ideas:

1. Build a large water retention wall across Chao Phraya river,
2. Build high wall along the beach,
3. Build more big dams upstream to hold water and prevent flooding.

## Action taken in structural changes

Two departments were established recently to deal with:

- Emergency response
- Coordinating government departments in rescuing, supporting and restoring affected communities
- Short term disaster warning and forecasting
- Loss and damage reporting

- There have been no assessments on potential impacts or changes in the next ten or twenty years.

Planning for sustainable future has not been initiated.

Adaptation efforts are in hands of unaware and uneducated public, businesses and households in disastrous affected areas.



Questions and comments



*Thank you*