

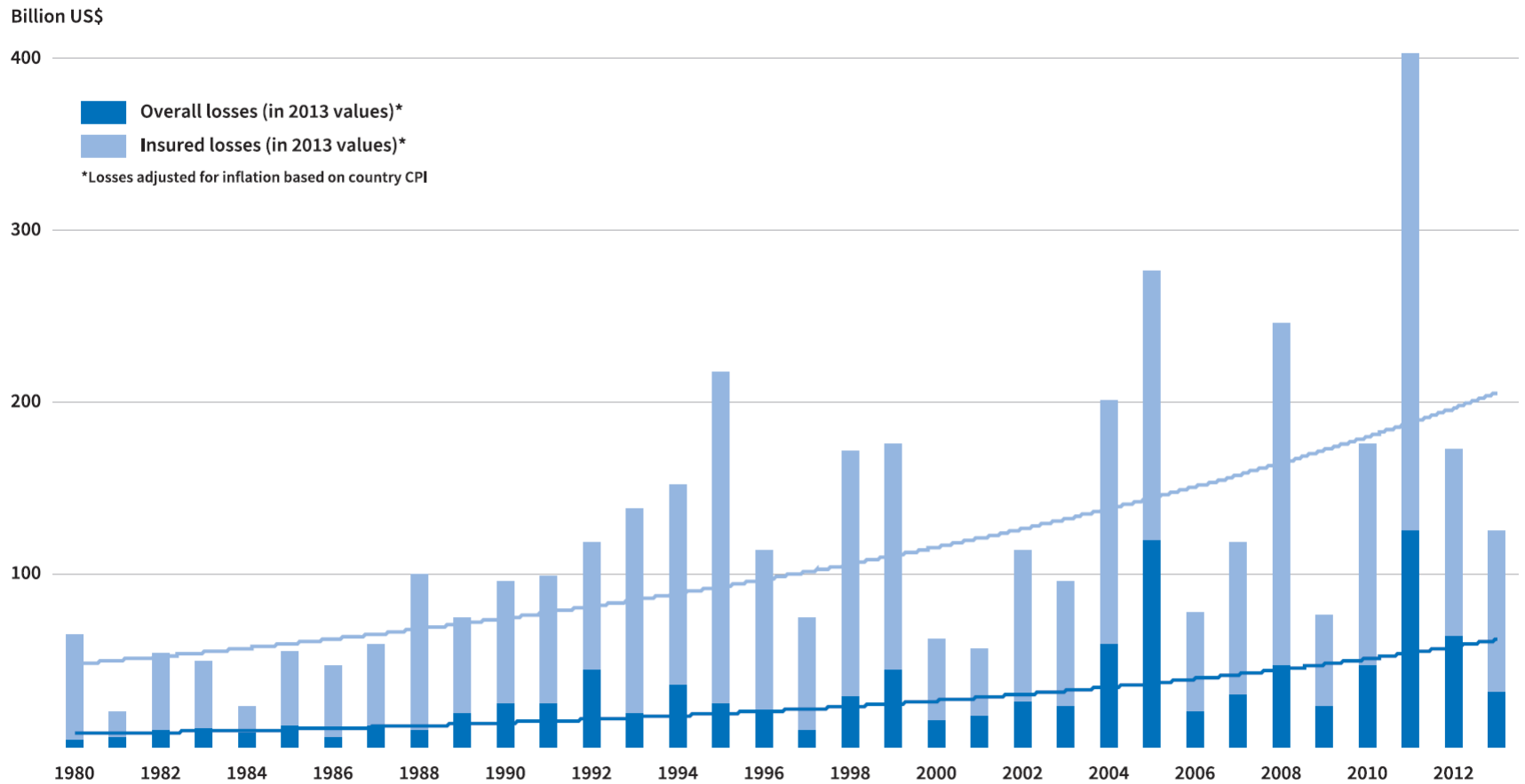
Introducing the Critical Infrastructure Protection Program in Taiwan

Dr. CHUNG-SHNEG LEE

National Science and Technology Center
for Disaster Reduction (NCDR)

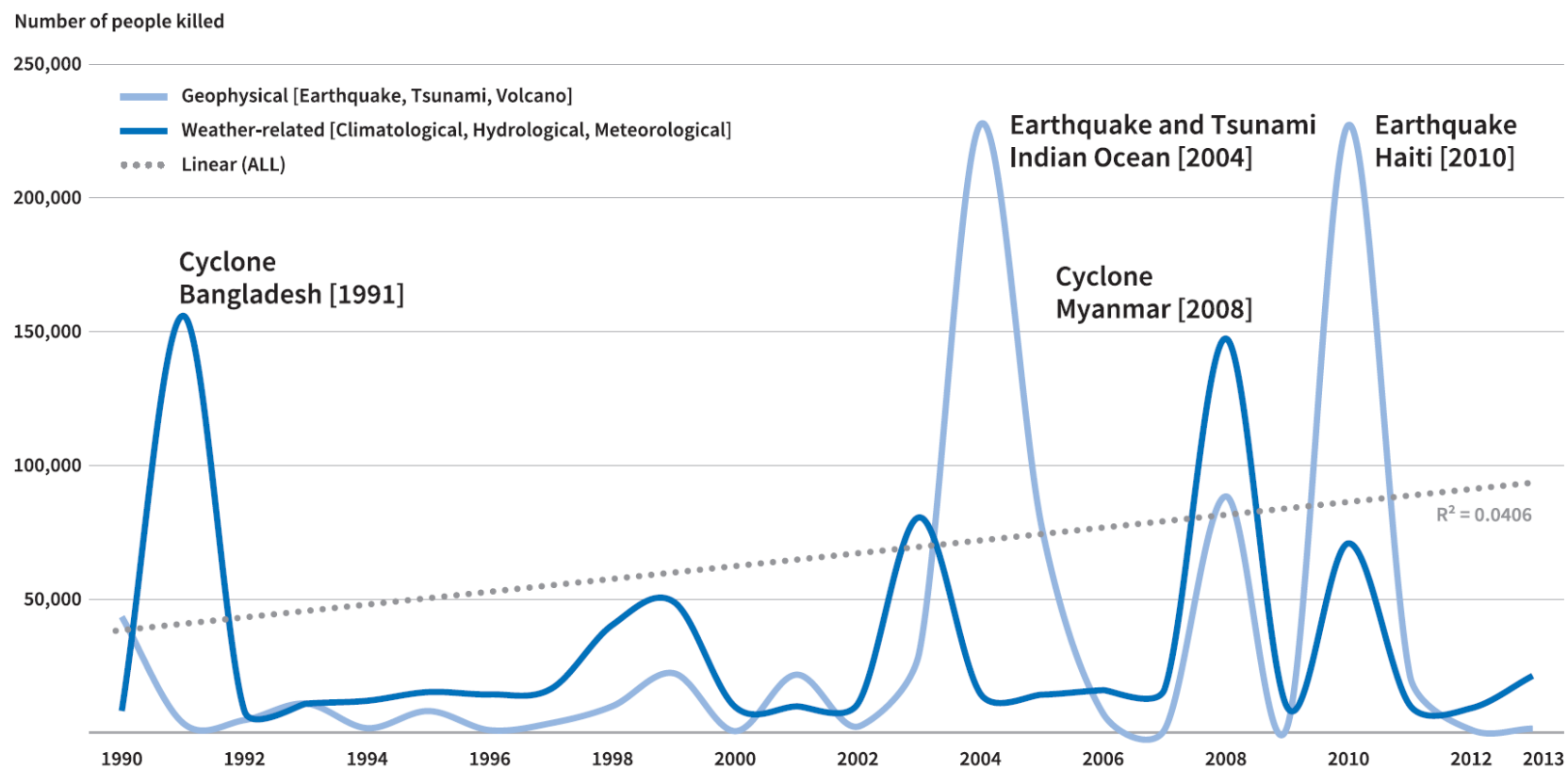
Figure 2.7 Overall and insured losses worldwide, 1980-2013

GAR 2015



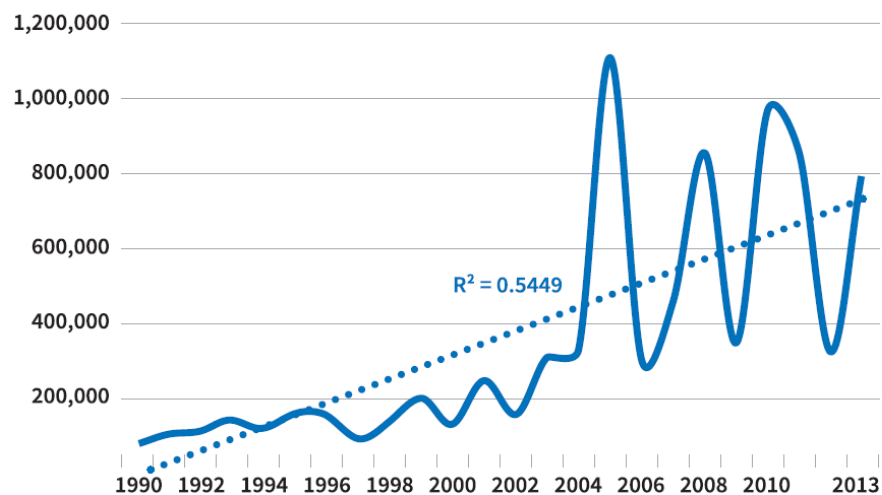
(Source: Munich Re, 2013: Geo Risks Research, NatCatSERVICE, as of January 2014.)

Figure 2.5 Mortality from disasters concentrated in few intensive events

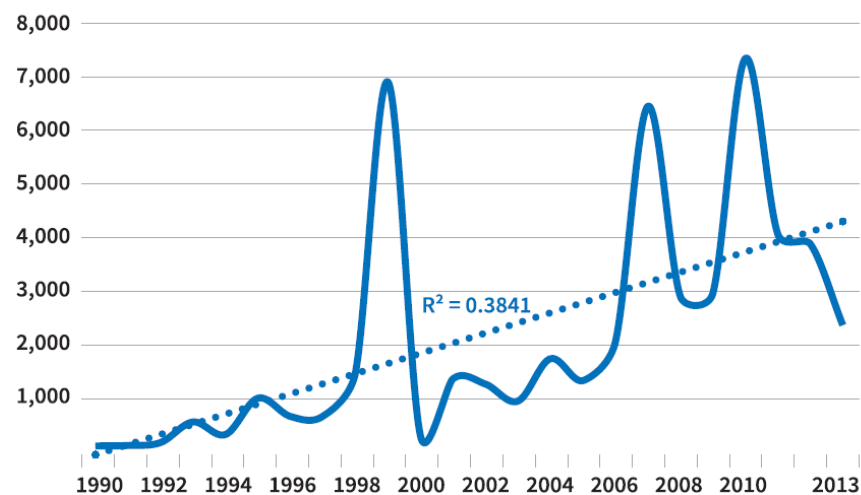


(Source: UNISDR with data from national loss databases.)

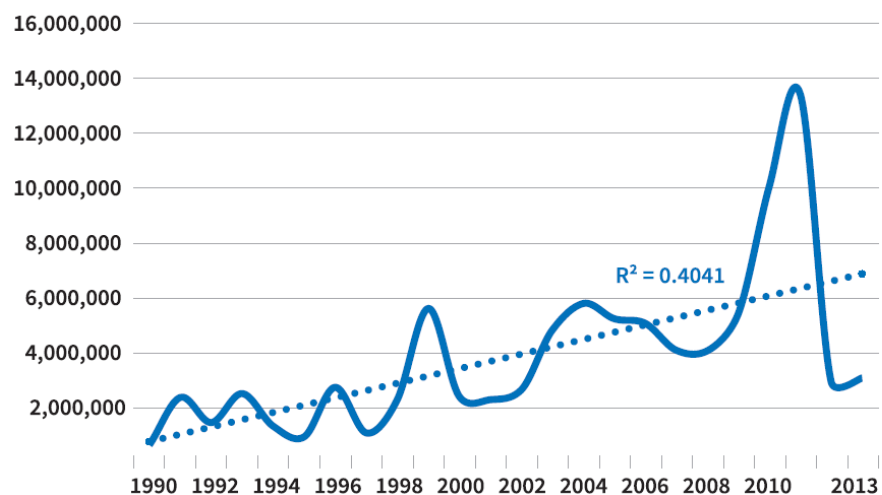
Reported damage to housing



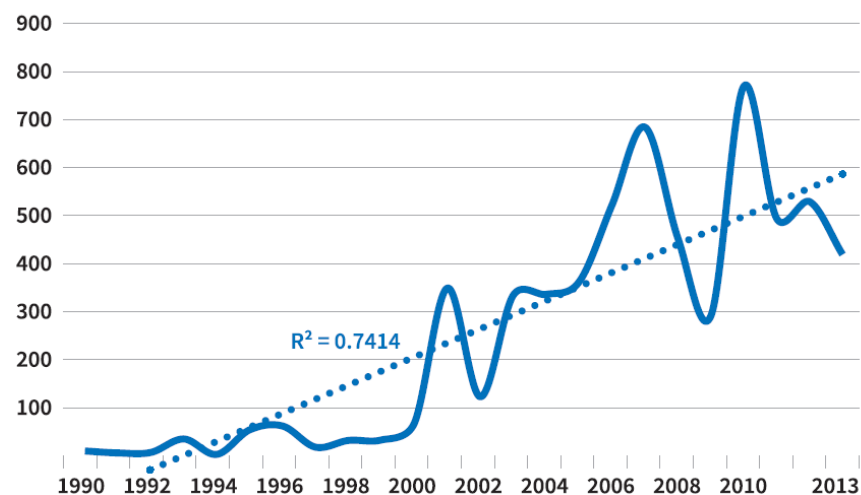
Reported damage to education facilities



Reported damage to agriculture in ha



Reported damage to health facilities



In last decade (2004~2014)

Because of Natural Disaster...

- More than 700,000 people died
- More than 1.4 million wounded
- More than 23 million people lost their home
- More than 1.5 billion people were impacted
- More than 1.3 trillion USD economic losses
- In 2008~2014, 140 million people were replaced

In next 15 years, the seven global targets are:

- Substantially reduce global disaster mortality per 100,000 @ 2020-2030 < 2005-2015
- Substantially reduce the number of affected people globally by 2030 per 100,000 @ 2020-2030 < 2005-2015
- Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030
- Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030**
- Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
- Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
- Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

Outline

- | What is CIP?
- | CIP Program in Taiwan
- | CI's Risks and Resilience
- | CIP Management Program
- | Future Work

What is CIP?

CIP:

Critical Infrastructure Protection

CIP's Development in US

- 1996/07: EO13010, President's Commission on Critical Infrastructure Protection PCCIP, (8 CI Sectors)
- 1998/05: PDD63, Establish the defense capacity of CIs in 5 years
- 2001/10: Patriot Act, NIPP (13 CI Sectors)



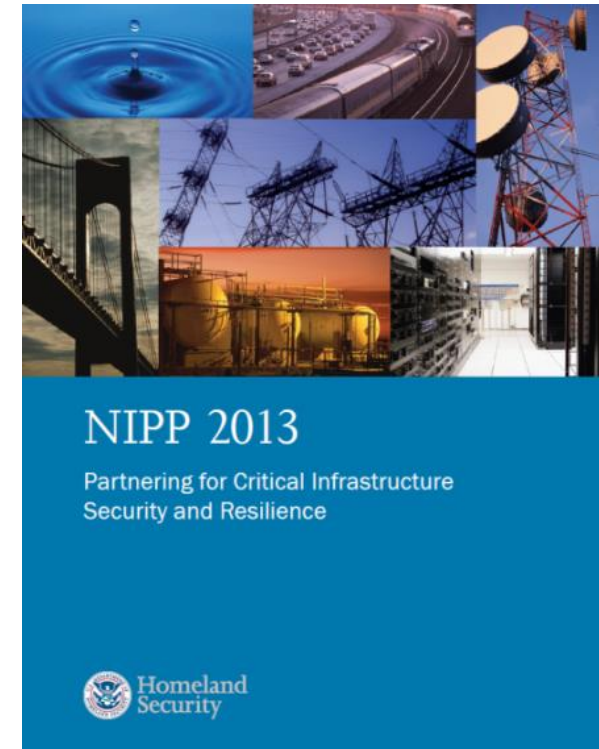
•1995/4/19 Murrah Federal Building, Oklahoma City



•2001/9/11 September 11 Attacks

CIP's Development in US

- 2009/01: NIPP 2009 (18 CI Sectors)
- 2013/02: EO13630, Security Enhancement on CIIP
- 2013/03: PPD21, Critical Infrastructure Security and Resilience
- 2013/12: NIPP 2013 (16 CI Sectors)
- 2015/12: Sector Specific Plan (SSP)



CI's Discontinuity

2012 US
Sandy Hurricane



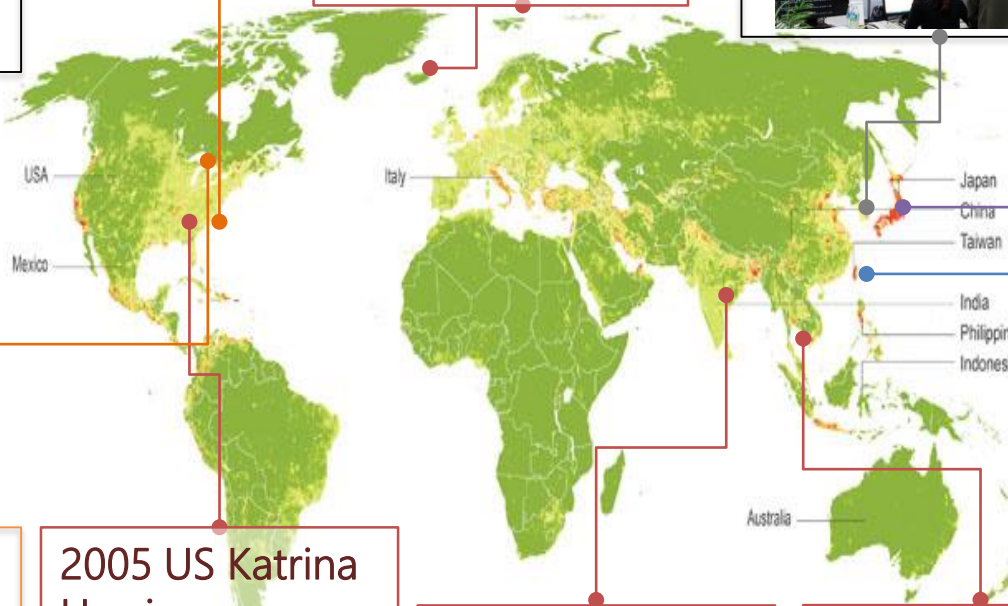
2010 Iceland
Volcano Eruption



2013 Kora Hacker
Attack



2011 Japan
Tohoku
Earthquake



1999 Taiwan
Chi-Chi Earthquake



2001 Taiwan
Nari Typhoon



2003 US &
CANADA
Blackout



2005 US Katrina
Hurricane



2012
India Blackout



2011 Thailand
Flood



Briefing of Science Parks in Taiwan

Hsinchu Science Park

Semiconductor, PC/Peripherals, Telecom,
Opto-Electronics, Machinery
Biotechnology

Jhunan Biotechnology,
Telecommunications Opto-Electronics

Tongluo

Defense technology Industry

Longtan

Opto-Electronics

Biomedical Park

Yilan

Telecommunications,
Knowledge service

Since 1980

Holi

Central Science Park

Precision Machinery Panel Industry

Since 2003

Yunlin

Agricultural Biotechnology

Southern Science Park

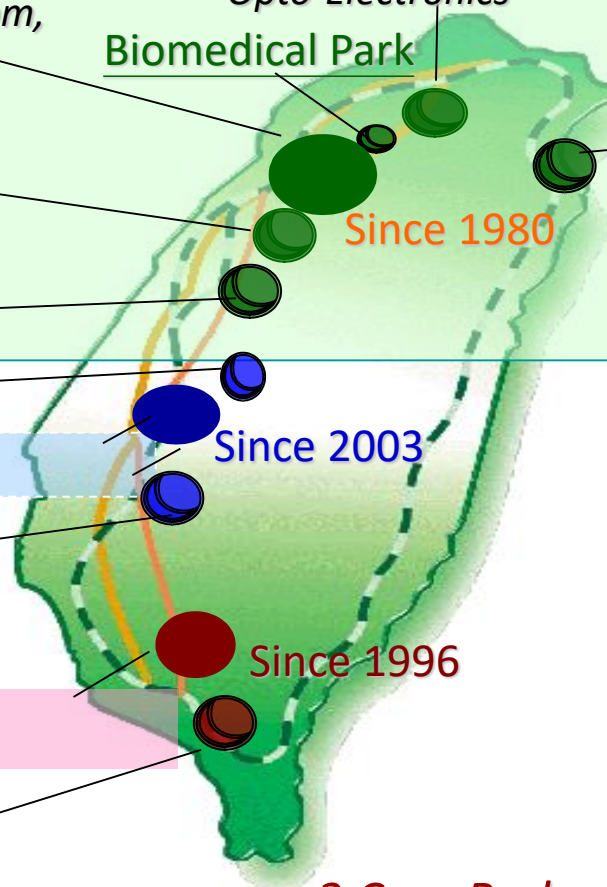
Semiconductor, Panel Industry

Kaohsiung

IC, Opto-Electronics telecommunication
Biotechnology

Since 1996

3 Core Parks + 8 Satellite Parks
Total 11 Science Parks



Economic Contributions by Science Parks

ICT is the engine of Taiwan's economy

- Proportion of GDP in manufacturing industry : 41.6% (2011)

In 2012, growth rate in all science parks is 5.2%

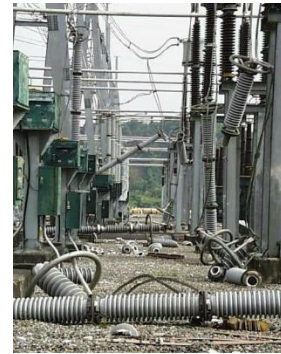
- Total production value exceeds USD\$ 67B, the second highest in history
- Created jobs 245,000,
- 54.6% of the whole value yielded by IC industry

Estimates for 2014

- Hsinchu Science Park, USD\$ 36B
- Central Science Park, USD\$ 12B
- Southern Science Park, USD\$ 22B

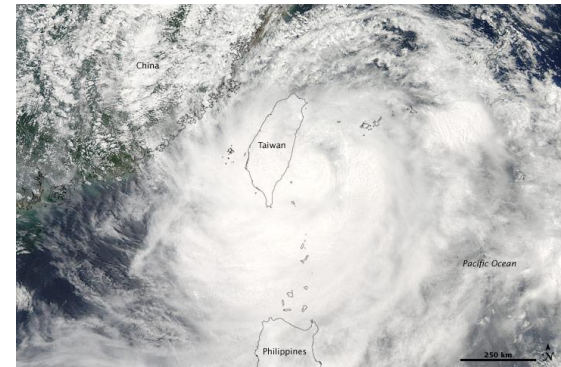
Natural Disaster Impacts on Science Parks

- ◆ 1999.09.21 Chi-Chi Earthquake ~ 10 billion (Hsinchu Science Park)



<http://gisdb.ncree.gov.tw/Photos>

- ◆ 2009.08.07 Typhoon Morakot ~ 1.8 billions (Southern Industry Zone)



<http://images.1233.tw/typhoon-morakot-taiwan/>

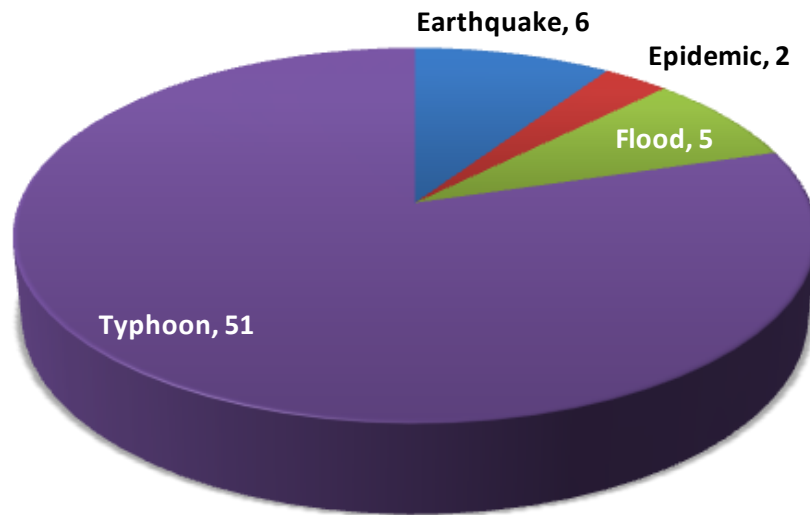
- ◆ 2010.09.17 Typhoon Fanapi ~ 3 billions (Southern Industry Zone)



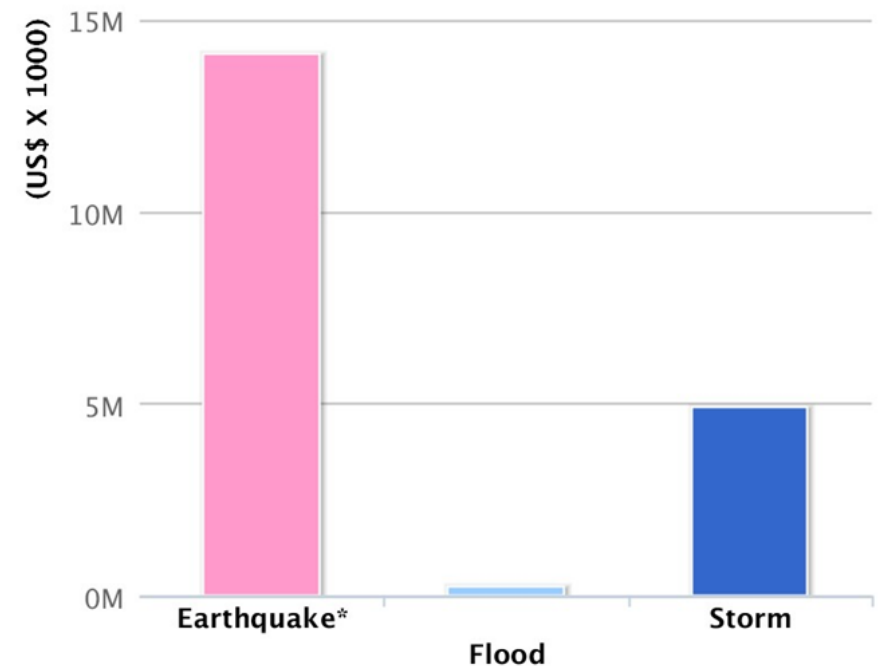
<http://www.huaxia.com/jjtw/jjtd/2010/09/2100894.html>

Natural Disasters in Taiwan

Natural Disasters from 1980 - 2010



Average Loss per Natural Disaster from 1980 - 2010



Source: PreventionWeb, 2012

CIP's viewpoint: Homeland Security

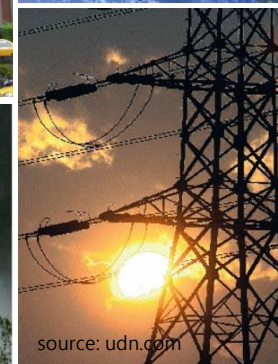
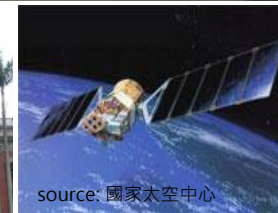


	Content
Homeland Security	Border Security 、 Social Safety
Mission Areas	<ul style="list-style-type: none">• Intelligence and Warning;• Border and Transportation Security;• Domestic Counterterrorism;• Protecting Critical Infrastructure & Key Assets;• Defending against Catastrophic Threats;• Emergency Preparedness and Response.

CIP Program in Taiwan:

Purpose:

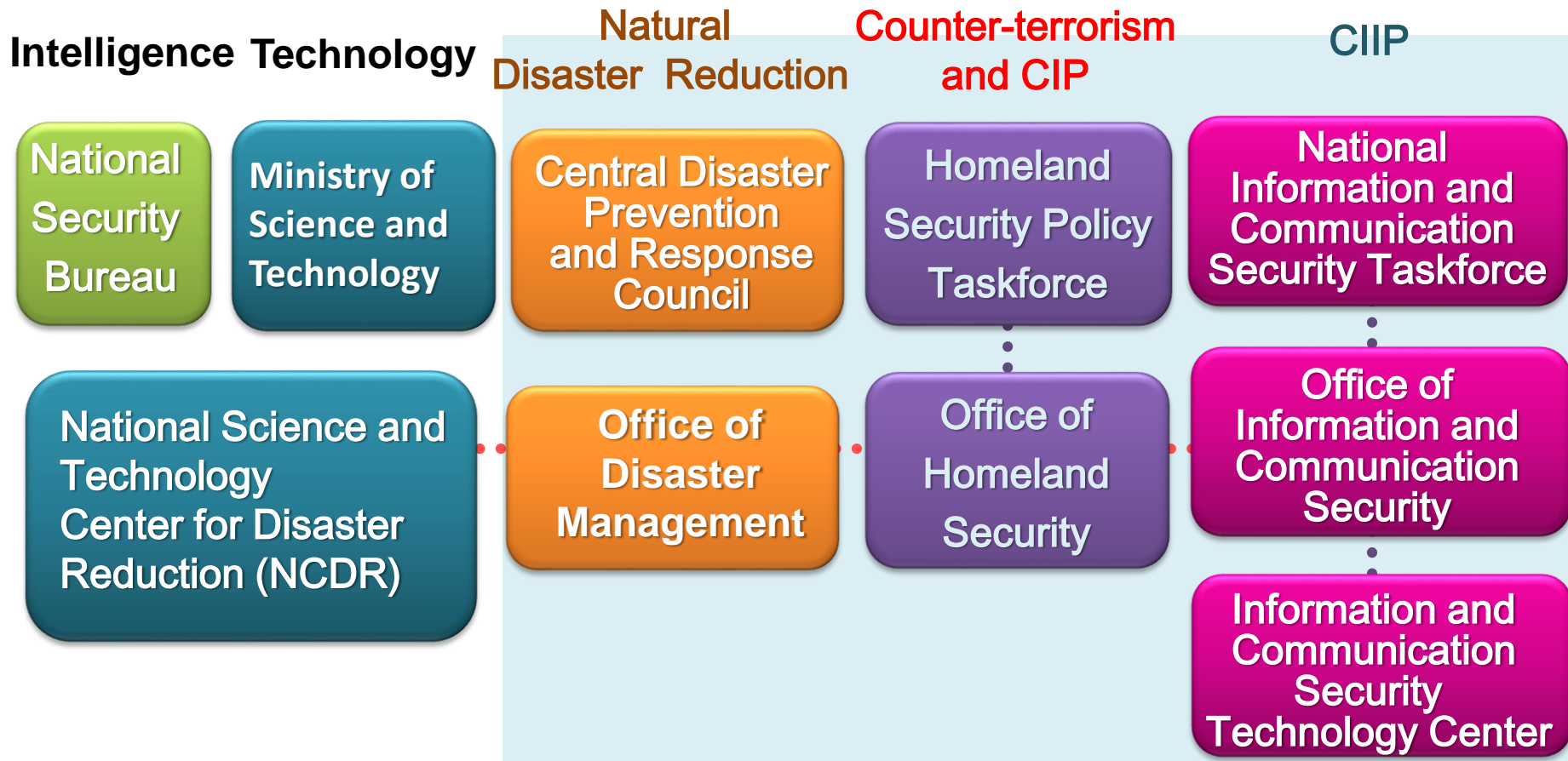
- Assure CI's operation
- Protect critical facilities, technology and key resources
- Reduce casualties and economic losses
- Confine the influence of CI's malfunction
- Emergency response and rapid recovery from incident



Organizational Framework and Functions



The National Security Council



Definition of Critical Infrastructure

「CI represents the **physical and virtual assets**, production systems and networks in the public and private domains that are so vital that impairment or destruction of such infrastructure from **man-made or natural causes** would **impact the operations of government and society**, result in losses of life and property, cause economic decline, alter the environment, or harm national security or other interests.」

Criteria of Critical Infrastructure

- | Affect the major functions of a government agency.
- | Directly or indirectly affect a large portion of the population.
- | Directly or indirectly result in economic losses.
- | Directly or indirectly affect the functioning of other CIs.

Critical Infrastructure Sectors in Taiwan



Energy
能源



Financial Services
銀行與金融



Water
水資源



**Emergency Services
and Public Healthcare**
緊急救援與醫院



Communication
通訊傳播



Government Facilities
政府機關



Transportation System
交通



**Science and Industrial
Park**
科技與工業園區

Hierarchy of CI Sectors

Sector

Determined collectively by experts and officials based on extensive research

E.g.

Transportation

Sub-sectors

Each sector is further divided into sub-sectors depending on its nature and characteristics.

Land

Aerial

Maritime

Postal and
Logistics
Services

Critical Elements

Refer to the equipment, operating communications, information, security systems that are essential for sustaining functioning

Key
Bridges

Key
Tunnels

Control
Systems

Dispatch
Center

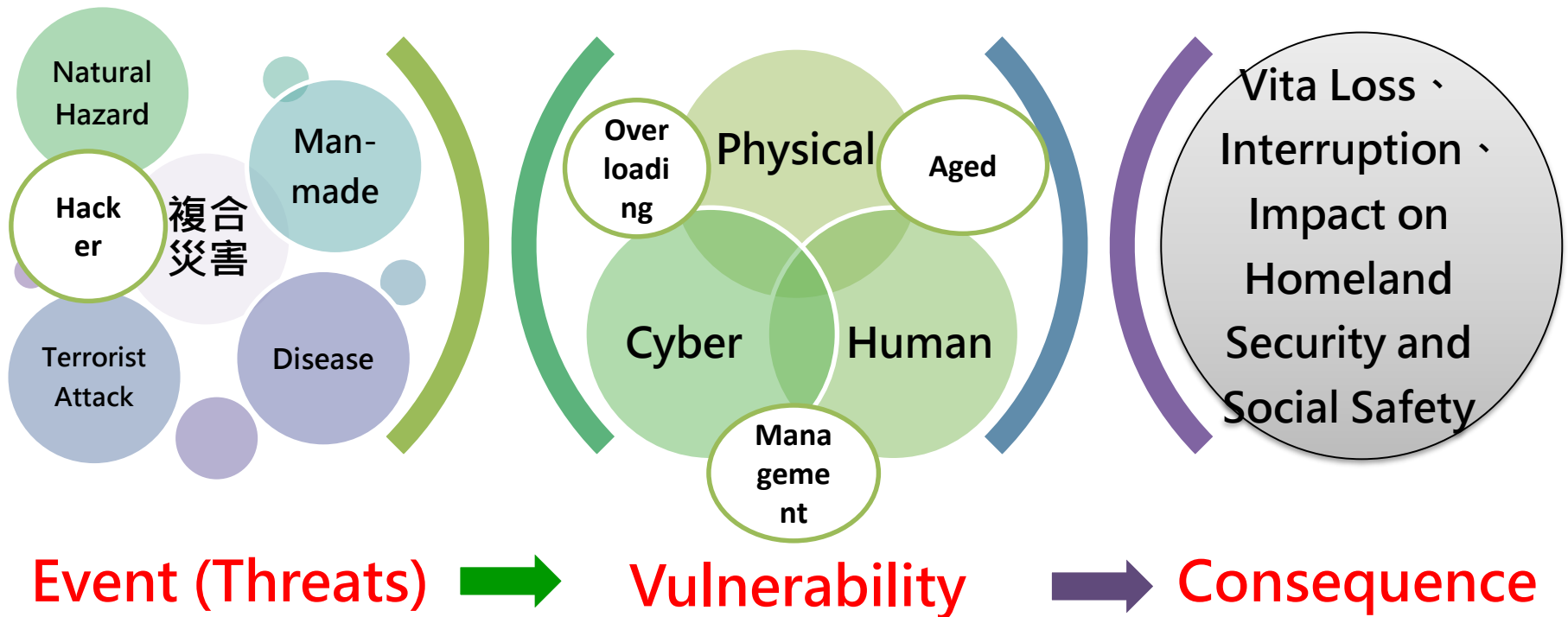
Critical Infrastructure Sectors



Critical Infrastructure Sectors	Sub sectors
1. Energy	Electricity, Oil, Natural gas, chemicals and Nuclear materials
2. Water	Water, Reservoir, Water Treatment Systems and Water supply network
3. Communications	Communication, Information Technology
4. Transportation Systems	Land transportation, Aviation, Maritime Transportation System, meteorological facilities and Postal and Shipping
5. Financial Services	Bank, Financial market and Exchange
6. Emergency Services	Emergency medical services
7. Government Facilities	Key person, facilities, Government Service Network, National Monuments and Icons
8. Science and Industrial Park	Science and Industrial park, Biomedical Science park, Software park

Risk is the “effect of uncertainty on objectives” and an effect is a positive or negative deviation from what is expected (ISO 31000).

Element of Operation



CI's Risks

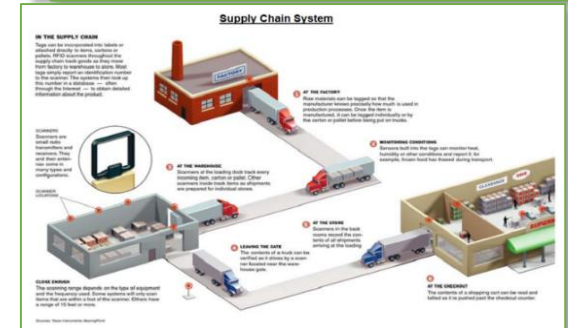
Natural Disaster



Manmade Disaster



Cascading Impact



Incident



Cyber Attack

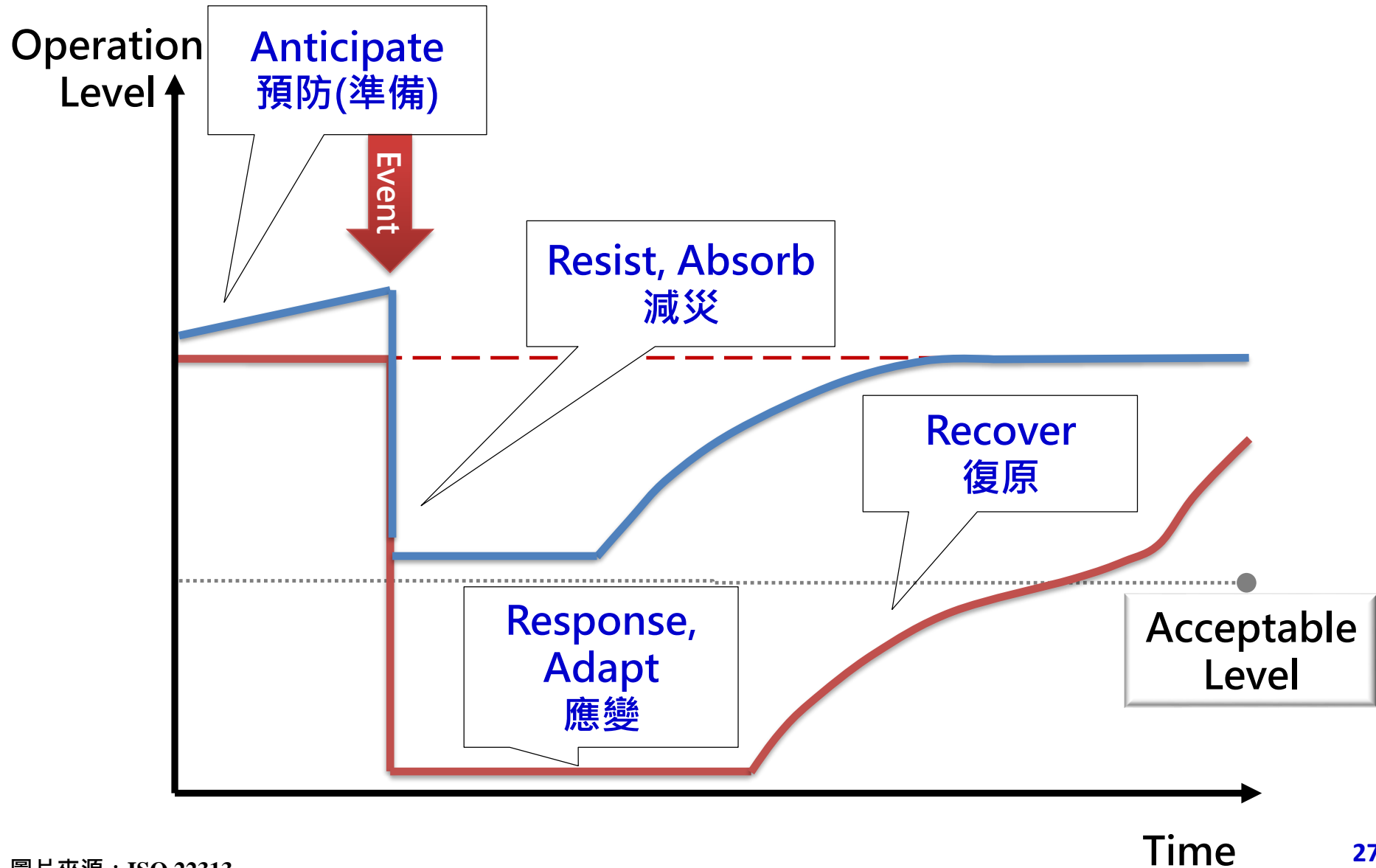


others



- The National Infrastructure Advisory Council (NIAC, 2009) : *Infrastructure resilience* is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to *anticipate, absorb, adapt to,* and/or *rapidly recover from* a potentially disruptive event

Resilience



The goal of CIP in Taiwan



10 steps to build-up BCP

1. Determine BCP purpose, scope and team.
2. Prioritized activities and Recovery Time Objective
3. What do you need to resume key activities?
4. Risk assessment – know your tragic scenarios
5. Do not forget pre-disaster protection and mitigation
6. Emergency response to disaster
7. BC Strategies to early resumption
8. Be financially prepared
9. Exercise makes your plan functional
10. Ongoing review and improvement

Office of
Homeland Security
CIP Program

Task 1: System, Legislation and Promotion
Task 2: Risk Assessment and Methods
Task 3: Information Exchange Platform

- Definition classification
- System, legislation
- Training and Education



- Risk assessment and approach (fast & detailed)
- Protection strategies



- Database, management platform
- Information sharing

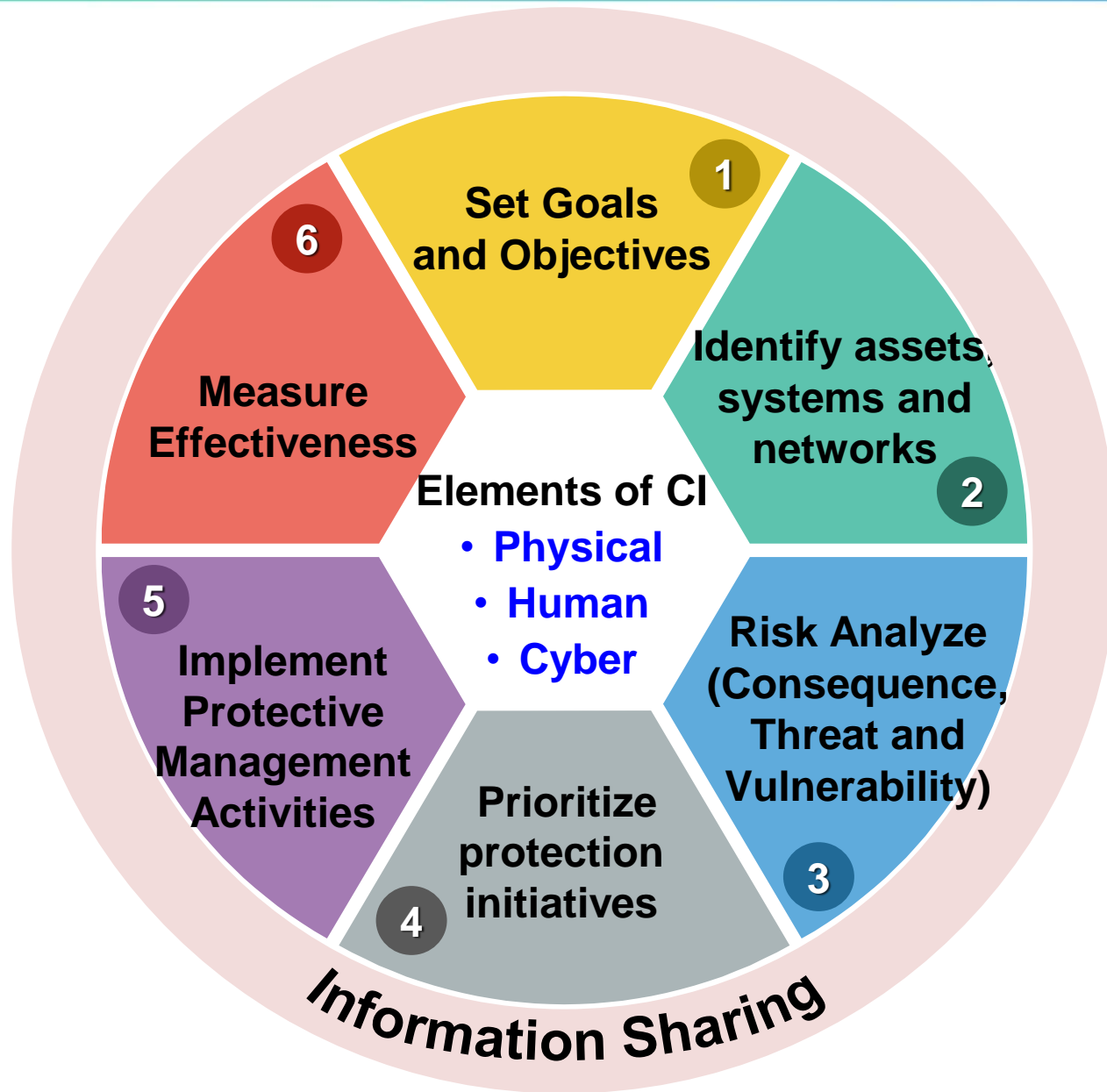
Critical Infrastructure Protection Management Implementation Guideline

行政院
Executive Yuan
Office of Homeland
Security

December 2014

1. Implement **Business Continuity Management** (BCM) to prevent all hazards
2. Develop **critical infrastructure protection management plan**
3. Establish **Public-Private Partnership Model**
4. Government Continuity of Operation (COOP)

CI Risk Management Framework

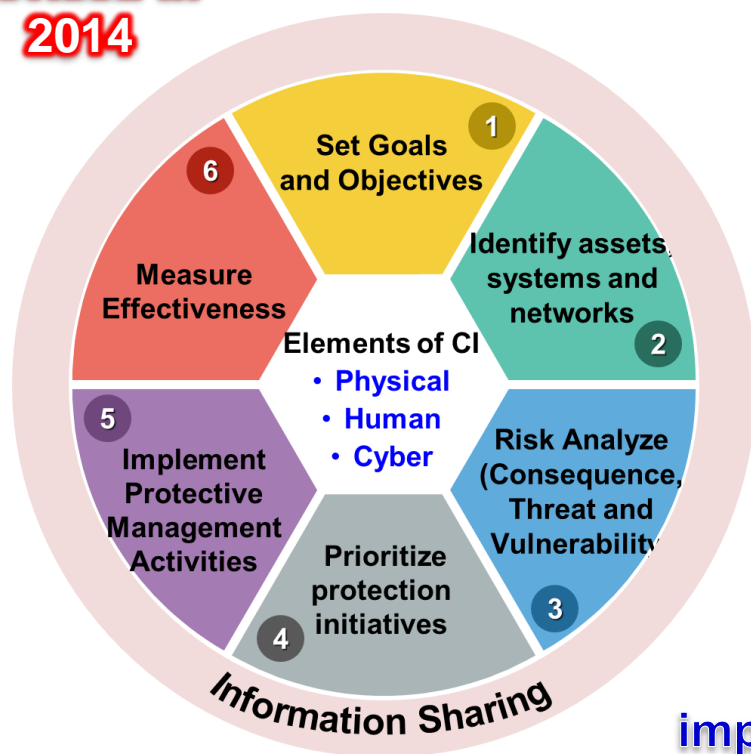


CIPM Implementation

Critical Infrastructure Protection Management Implementation Guideline

Revised in
2014

Issued in 2016



Issued December 2014
Revised February 2015

implementing

National CIP Plan

National plan

CI Sector Plan

8 Sectors

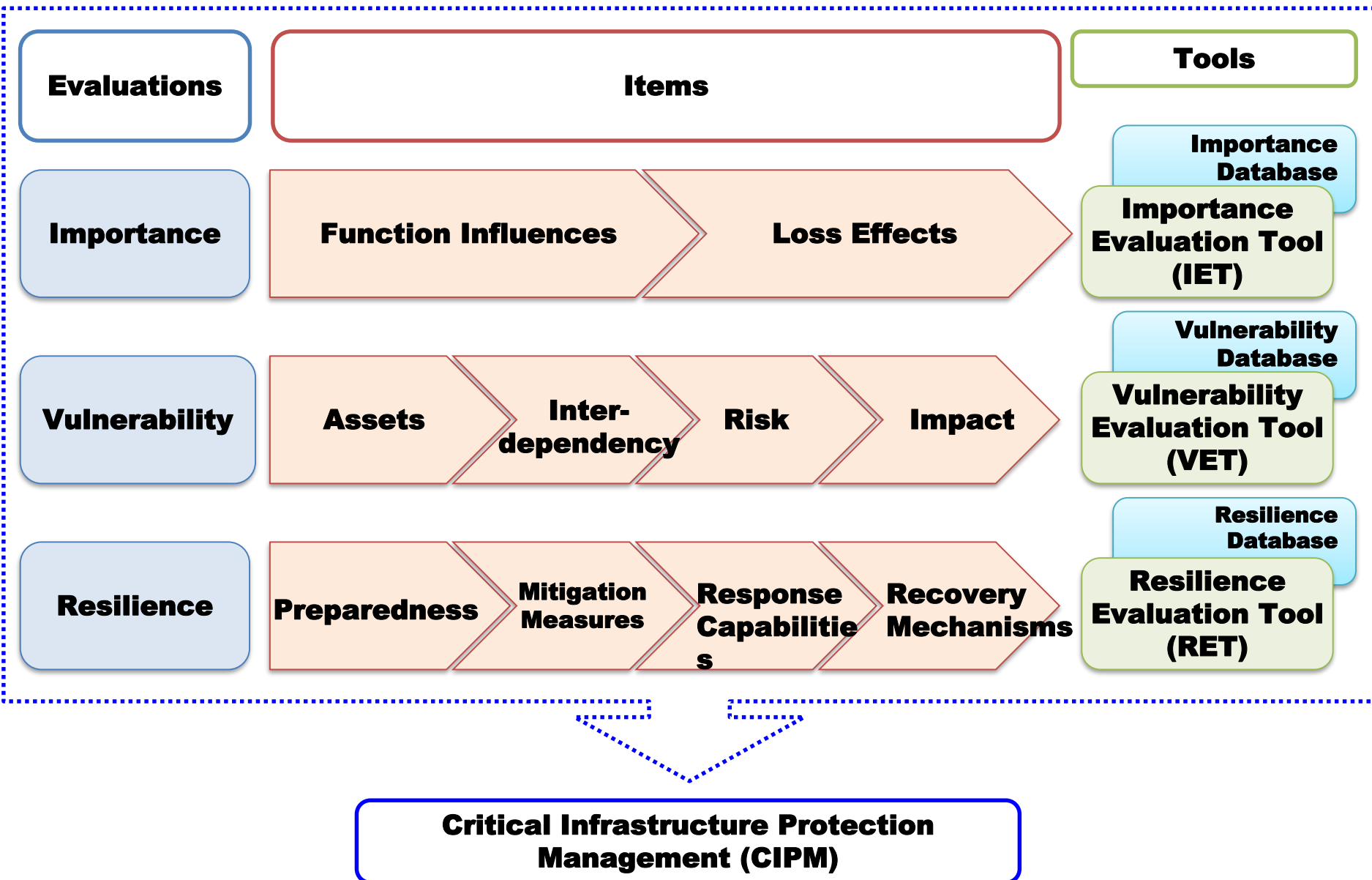
Subsector Plan

25 key subsectors

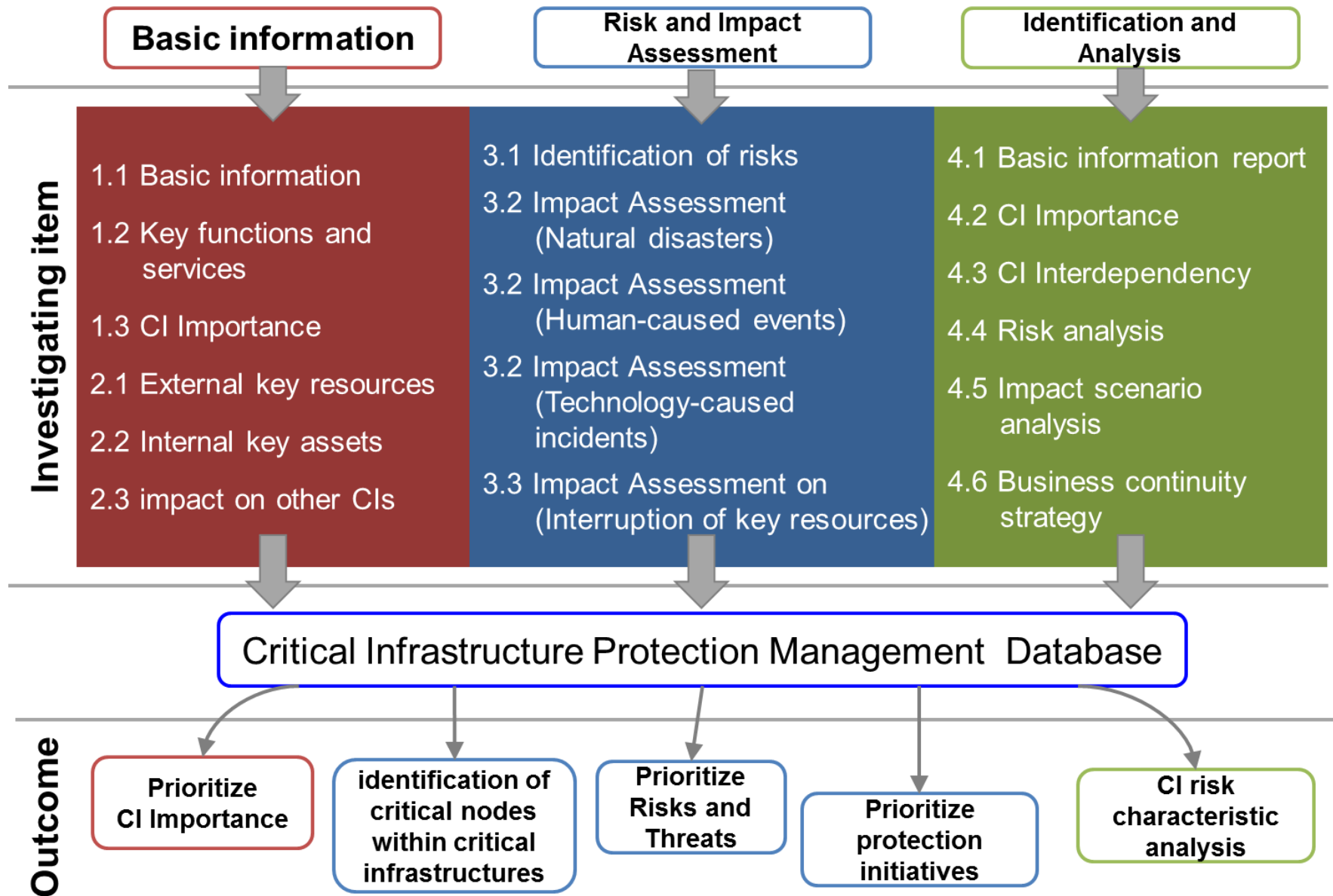
Individual CIP Plan

About 1500 CIs

CIPM Tools



CI Risk Survey Spreadsheet



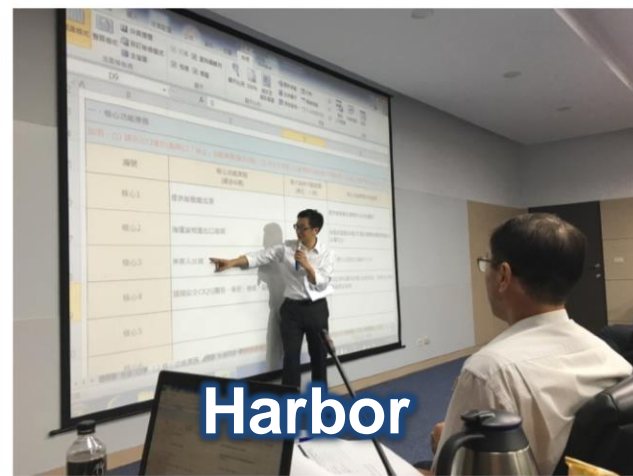
CI Risk Survey, Training and Exercise



Science Park



Government Facilities



Harbor



Power plant



airport

Future Work



- Enhance a council mechanism for coordinating sectors
- Implement international cooperation and experience exchange
- Involve participation of local governments and private sectors.
- Strengthen the legislation of regulations or laws relevant to CIP
- Emphasize risk analysis and impact assessment
- Conduct CI training, education and knowledge sharing

Thank you
for your attention

