Digital Competitiveness & Resilience: the Keys to Win the Future

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APECO2O Expert Network Meeting
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“The extreme” of Absolute Economic Exposure published by Maplecroft in 2011

Natural Hazards Risk – Absolute Economic Exposure Index 2011

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<tr>
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Observations of “New normal” and its impacts - “unprecedented” becomes “normal”

• “New normal” could be found “increasing trends” in
  – Intensity of rainfall
  – Strength of typhoons
  – Occurrence of extreme weather events (floods, droughts)

• The adverse impacts would be amplified by
  – Increasing population
  – Rapid and unplanned urbanization
  – Poor land use
  – Climate change
  – Vulnerable global supply chain
  – Economic activities exposed to natural hazards
Global trend – “New Normal”

• How science, technology and research address “new normal”?
• How policy and capacity building are designed for disaster risk reduction and policy making?
• How can science, technology and research be applied to facilitate DRR collaboration between and among economies, the private sector, and international organizations?

Home elevation after Superstorm Sandy in New Jersey

“new normal”
New challenges to livelihoods and economy development by natural disasters

Population at risk of exposure was increased due to accelerating urbanization and climate change (Flood in the Philippines, 2009)

Due to expansion of the global economy, business activities exposed to risk is expanding. (Flood in Thailand, 2011)
Issue 1: Scenario-based information for exercise and evaluation

- **Cases of large-scale compound disasters in recent years (Black-Swam Event)**
  - 2005 Hurricane Katrina, 2009 Typhoon Morakot, 2011 the Great Tohoku Kanto Earthquake and Tsunami
  - How to make them “gray”

- **Problems founds**
  - 1) “Unprecedented and complicated” impacts, 2) continuously developing situations, 3) simultaneous urgent demands, 4) challenges to engineering-based measures, 5) lacks of information integration....

- **Demands for disaster risk information**
  - Tools to build up scenarios for planning and drills
  - Design of information system to provide situation awareness
  - Estimation of quick-relief demands after large-scale compound disasters
  - Study of evolutional characteristics of compound disasters
Issue 2: Climate change adaptation strategies with disaster risk reduction

- **Challenges of climate-change-related disasters**
  - Direct impacts: 1) Higher temperature; 2) Sea level; 3) Rainfall distribution change; 4) More extreme rainfall events; 5) Typhoon and storm surge
  - Evolving impacts: 1) Slope land disasters; 2) distribution of water resource; 3) investment on new development projects.....
  - Change rules and practices to do business

- **Demands for develop CCA and DRR**
  - To define “non-regret” measures to fit requests from both
  - Risk map to identify risk potential based on impacts by hazards like flood, slope land, land subsidence, vulnerability of costal areas


### Issue 3: Business vulnerability assessment

**NHK Disaster Big Data - Key to recovery**

- **Overlapping of hazard map and business operation on exposure to identify “hot spots”**
  - Considered social factors: 1) population density and structure, 2) education and income, 3) economic activities, 4) past events and perception, 5) social support, 6) insurance ....

- **Problems found due to social development**
  - 1) Rapid urbanization, 2) land use management, 3) aging society, 4) vulnerability of indigenous tribes, 5) tools for risk communication, 6) disaster resilience at community level ....

- **Products to be delivered**
  - Network of doing business
  - Models for loss estimation
  - Establishment of Social-economic Vulnerability Index (SVI) and Human Development Index (HDI)
Issue 4: Critical infrastructure protection under threats from natural hazards

- **Threats**
  - CI is lifeline system to business operation

- **Problems founds due to CI’s failures**
  - Security issue
  - Government and business operation continuity
  - Basic civil protection
  - Direct impacts to people’s livelihood.

- **Current developments for improving critical infrastructure protection**
  - Failure modes to individual hazards by risk assessment
  - Impact evaluation of system(s) failure
  - Status indicators for monitoring system satiability

Typhoon Aere, 2004

Chi-Chi Earthquake, 1999
Briefing on the Science Parks in Chinese Taipei

**Hsinchu Science Park**
- Semiconductor, PC/Peripherals, Telecom, Opto-Electronics, Machinery
- Biotechnology

**Jhunlan**
- Biotechnology, Telecommunications, Opto-Electronics

**Tongluo**
- Defense technology Industry

**Central Science Park**
- Precision Machinery, Panel Industry

**Yunlin**
- Agricultural Biotechnology

**Southern Science Park**
- Semiconductor, Panel Industry

**Kaohsiung**
- IC, Opto-Electronics, Telecommunications, Biotechnology

**Longtan**
- Opto-Electronics

**Biomedical Park**
- Since 1980

**Yilan**
- Telecommunications, Knowledge service
- Since 1996

**Since 2003**

3 Core Parks + 8 Satellite Parks
Total 11 Science Parks
## Economic Contributions by Science Parks

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<th><strong>ICT is the engine of Chinese Taipei’s economy</strong></th>
<th>• Proportion of GDP is 14% of all (2016)</th>
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</table>
| **In 2016, growth rate in all science parks is 2.94%** | • Total production value exceeds USD$ 89.5B, the highest since 1980  
• Created jobs 296,000, 000  
• Over 50% of the whole value yielded by IC industry |
| **Values of 2016** | • Hsinchu Science Park, USD$ 46.5 B  
• Central Science Park, USD$ 16 B  
• Southern Science Park, USD$ 27 B |
Capital-intensive investment

• Practice of TSMC, unit: USD 100 million

• Too big to fail

• For 2017, still over USD 10b
Expected or non-expected damages to production lines after 2016 quake

Fallen pipelines

Assembly line
Focal issues of digital competitiveness & resilience

• Identification and understanding of “risk”
  – Risk priorities (direct or indirect risks)
  – Internal and external risk
  – Physical and Social vulnerabilities

• Tools for risk communications and assessment
  – Applications of big data and open data on GIS systems
  – Channels to receive early warnings

• Financial tools to encourage measures on risk reduction
  – Incentives of insurance premium or interest rate of loan

• Standards for the whole supply chain to follow
  – ISO 22301, Area Business Continuity Management

• Scenarios to make plans and conduct drills
  – the worst or reasonably worst case to test defense capacity
Characteristics of risks for different scale of business – allowance of failure and interruption

- Accept certain level of failures
- Accept limited level of failures
- Accept “no” failures

Challenges to engineering design and construction

Expanding operation scale

But anyhow “Black Sam” always exists “Residual risk”
Further comprehensive collaboration on business resilience through regional synergy

- Emergency Response
- Travel Facilitation
- Global Supply Chain Resilience
- Application of Open data and Big data to Emergency Preparedness
- Critical Infrastructure Security and Resilience

APEC Contributions

UNISDR
SFDRR
Private sector’s involvement
Recommendations on Resilient SMEs to enhance business’s role at DRR (SMEWG, EPWG)

• Establish SME Business Continuity Plans to Facilitate Trade and Investment
  – Develop exclusive BCPs for all other industries to build up the capacity on disaster resilience for SMEs.

• Implement BCP Guidebook for Better Global Supply Chains
  – Disseminating Guidebook in different languages
  – Organizing the local training programs to train the seed trainers
  – Sharing the best practices, knowledge and information

• Enhance the Public-Private Partnership and Cross-Fora Cooperation
  – Collaborating within APEC and other organizations for promoting BCPs at SMEs
  – Integrating the resources from the public and private sectors and experts to strengthen the capacity of SMEs
Seven Principles for enhancing global supply chain resilience (TPTWG, EPWG)

1. Share information and knowledge
2. Promote disaster risk management and hazard mapping
3. Support planning and business continuity
4. Promote best practice policy, regulations, and flexibility
5. Leverage regional cooperation to support the supply chain,
6. Promote critical infrastructure protection
7. Recognize and promote best practice in human resource and capacity management
Collaborations on business resilience beyond 2014

- **Emergency Response Travel Facilitation**
  - Target: Business resumption to jump-start affected business
  - Travel facilitation to technicians and supporting personnel

- **Global Supply Chain Resilience**
  - Target: Resilient trade environment
  - Capacity building on regional business continuity management

- **Application of Open data and Big data to Emergency Preparedness**
  - Target: Better hazard information preparedness for business
  - Information-based support to business continuity plan

- **Critical Infrastructure Security and Resilience**
  - Target: Resilient lifeline for business operation
  - Solutions to reduce business interruptions
APEC Disaster Risk Reduction Framework
Oct. 2015

Adaptive and Disaster-Resilient Asia-Pacific Economies Supporting Inclusive and Sustainable Development

- Prevention and Mitigation
- Preparedness
- Response
- Rehabilitation and Build Back Better

Community Participation
Disaster Risk Governance
Disaster Risk Financing
Science and Technology

Critical Infrastructure Resiliency
Ecological Integrity
Inclusiveness of Women and Vulnerable Sectors in DRR
Background and aims to establish EPCC
APEC Emergency Preparedness Capacity Building Center

• Background
  – Help to secure sustainable economic development and resilience
  – Minimize the potential interruptions from natural disasters or human behaviors

• Aims
  – Collecting regional synergies and resources to meet the demanding needs of sustainable economic development.
  – Implementing practical and scientific-based training programs
  – Establishing knowledge database in disaster risk reduction
  – Promoting capacity building through continuous investments and joint efforts
  – Providing solid capacity building for better preparedness to mitigate the impacts brought by natural hazards
Missions and Cross-fora Collaborations under EPCC

• Missions

1. Hosting well-structured capacity-building activities: to support EPWG mandate

2. Establishing knowledge database: collecting best experiences, science and technology to support policy and decision making;

3. Enhancing public-private-people partnership in disaster risk management:

4. Building a win-win networking: extensively engaging regional efforts and institutions to formulate an interactive learning organization.

• Cross-fora Collaboration among EPWG, SMEWG and PPSTI

– Providing human capacity investment and technology transfer scheme

– Seeking collaboration with PPSTI, SMEWG, TPTWG, TWG, TELWG, ISTWG, CTWG, HWG, ABAC and regional institutes to ensure the crosscutting outcomes.
APEC Summit on Resilience and Capacity Building Training
Workshop on Promoting Business Connectivity

10 – 13 April, 2017
Nagoya, Japan
Synergized work on regional BCP/BCM – cross sectorial collaborations

• Managing risks and impacts of natural disasters to business in the Asia-Pacific region with Public-Private Partnership
  – To offer feasible solution package to enhance regional resilience
  – To initiate a pilot study on BCM-based supply chain

• Seeking leadership and coordination for cross-sectorial coordination
  – To engage key stakeholders though Public Private Partnership
  – To keep flexibility among Private Sector, NGOs, NPOs and government to take leading role
  – To manage risk of critical infrastructures
Accumulation of knowledge, experience and know-how of BCP and BCM

- **Information-intelligence knowledge Platform**
  - To build up Integrated systems and database adopt Open Data Approach
  - To design scenario-based joint drill in the APEC region
  - To involve the disaster risk management with financing sectors
  - To keep BCM rating transparent
  - To discuss disaster sign standard for risk communication

- **knowledge transfer and the best Practices sharing of BCM**
  - To share information
  - To share experiences of formulating BCPs
  - To provide solution package on challenges while implementing BCPs
Thank for your attention
BCP, an umbrella for the rainy days

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