การจัดประชุมกลุ่มย่อย

โครงการศึกษาผลกระทบจากการเปลี่ยนแปลงและความแปรปรวนของสภาพภูมิอากาศในอนาคต ความล่อแหลม เปราะบางและการปรับตัวของภาคส่วนที่สำคัญ

Human settlement

วันพฤหัสบดีที่ 16 กรกฎาคม 2558 เวลา 8.30-16.00 น.

ณ ห้องประชุม VIE Function 1&2 ชั้น 12 โรงแรมวี กรุงเทพฯ

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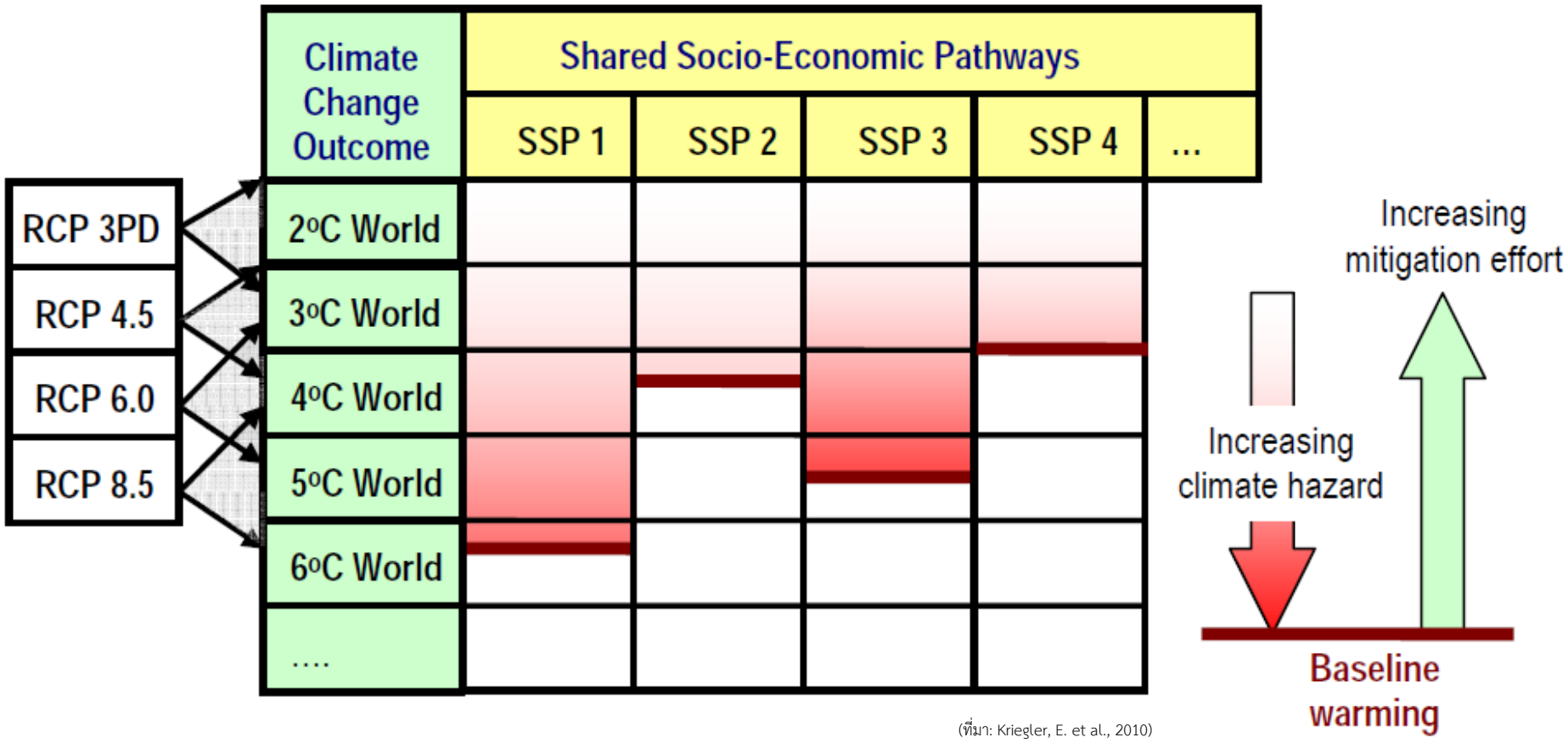
การปรับตัวต่อการเปลี่ยนแปลงภูมิอากาศกับยุทธศาสตร์การพัฒนา

สกว, SEA START RC http://www.thailandadaptation.net

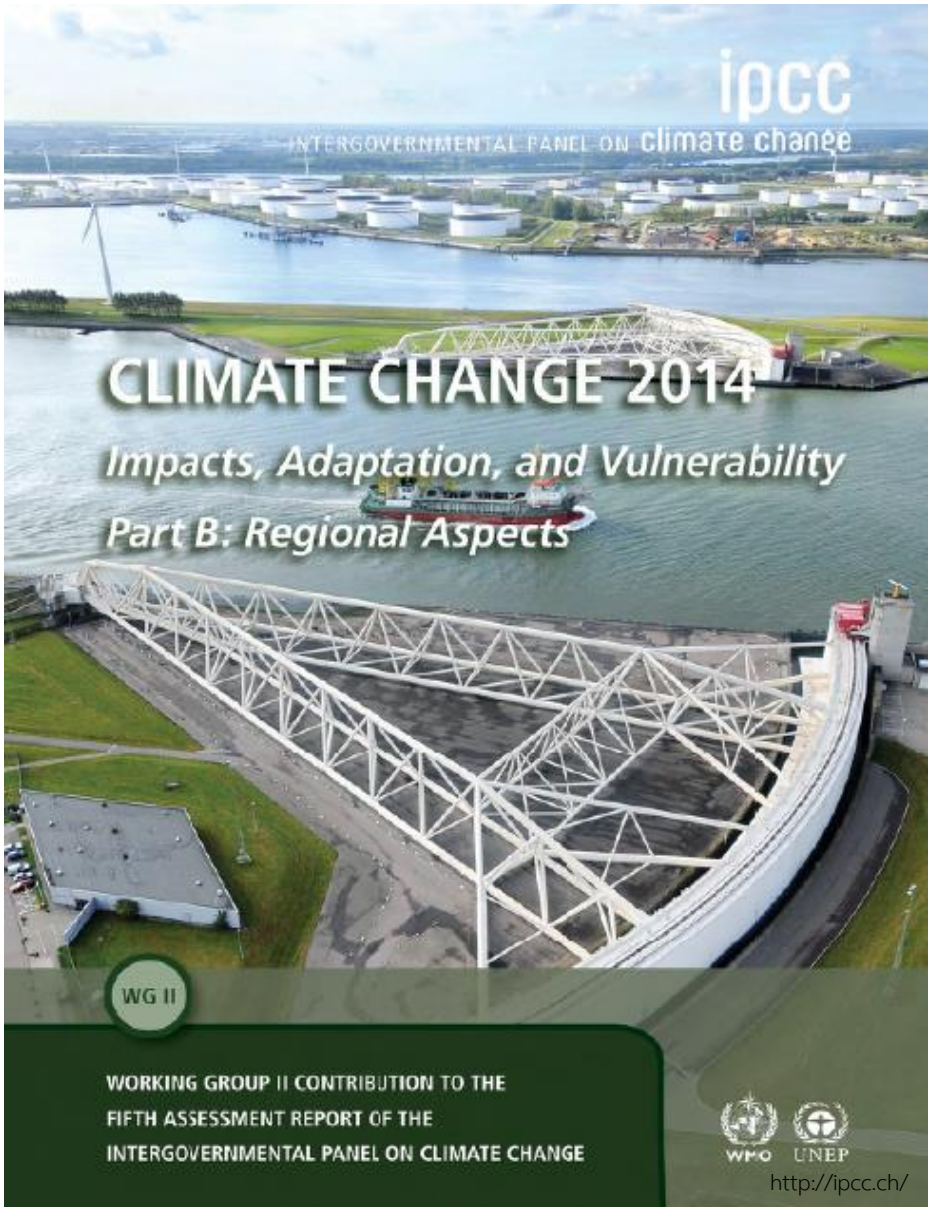
เมทริกซ์ของภาพฉายในอนาคต



(ที่มา: Kriegler, E. et al., 2010)

หมายเหตุ : RCP* (Representative Concentration Pathways) หรือภาพฉายการปล่อยก๊าซเรือนกระจกแบบใหม่ (New emission scenarios) ในรายงานฉบับที่ 5 กลุ่มที่ 2 ของคณะกรรมการระหว่างรัฐบาลว่าด้วยการเปลี่ยนแปลงสภาพภูมิอากาศ (*IPCC* AR4 WGII) รายละเอียดกรุณาดูใน http://ipcc.ch/

24.4.5. Human Settlements, Industry, and Infrastructure



- Around one in every five (1/5) urban dwellers in Asia lives in large urban agglomerations and almost 50% of these live in small cities (UN DESA Population Division, 2012).
- By the middle of this century, Asia's urban population will increase by 1.4 billion and will account for more than 50% of the global population (UN DESA Population Division, 2012)

24.4.5.2. Observed Impacts

- Asia:
  - The highest number of weather- and climate-related disasters in the world during the period 2000–2008 (IPCC, 2012)
  - Huge economic losses, accounting for the second highest proportion (27.5%) of the total global economic loss (IPCC, 2012)
  - .Flood mortality risk is heavily concentrated in Asia (UNISDR, 2011).

24.4.5.3. Projected Impacts

- Asia:
  - A large proportion of Asia's population lives in low elevation coastal zones that are particularly at risk from climate change hazards, including sea level rise, storm surges, and typhoons.
  - Depending on region, half to two-thirds (2/3) of Asia's cities with 1 million or more inhabitants are exposed to one or multiple hazards, with floods and cyclones most important (UN DESA Population Division, 2012).

24.4.5.3.1. Floodplains and coastal areas

- By the 2070s,
  - the top Asian cities in terms of population exposure (including all environmental and socioeconomic factors) to coastal flooding are expected to be Kolkata, Mumbai, Dhaka, Guangzhou, Ho Chi Minh City, Shanghai, Bangkok, Rangoon, and Hai Phong (Hanson et al., 2011).
  - The top Asian cities in terms of assets exposed are expected to be Guangzhou, Kolkata, Shanghai, Mumbai, Tianjin, Tokyo, Hong Kong, and Bangkok.
  - Asia includes 15 of the global top 20 cities for projected population exposure and 13 of the top 20 for asset exposure.

24.4.5.3.2. Other issues in human settlements

- Risks resulting from
  - (1) socioeconomic transformations, such as land title insecurity and price pressures;
  - (2) Local biophysical degradation, as periurban areas serve as sinks for urban wastes; and
  - (3) Climate change impacts, as they do not benefit from the innerurban disaster risk management measures

24.4.5.5. Adaptation Options

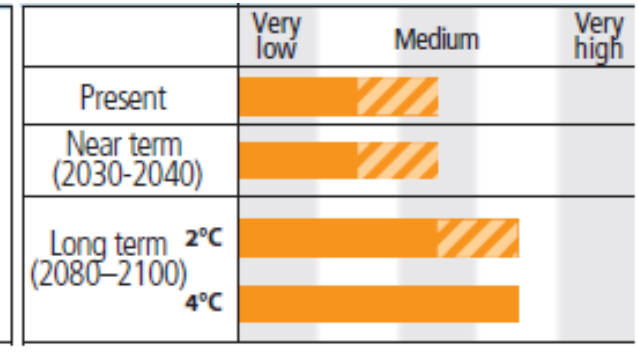
- An ADB and UN report estimates that “about two-thirds of the $8 trillion needed for infrastructure investment in Asia and the Pacific between 2010 and 2020 will be in the form of new infrastructure, which creates tremendous opportunities to design, finance and manage more sustainable infrastructure” (UN ESCAP et al., 2012, p. 18).
- The role of urban planning and urban planners in adaptation to climate change impacts has been emphasized (Fuchs et al., 2011; IPCC, 2012; Tyler and Moench, 2012).

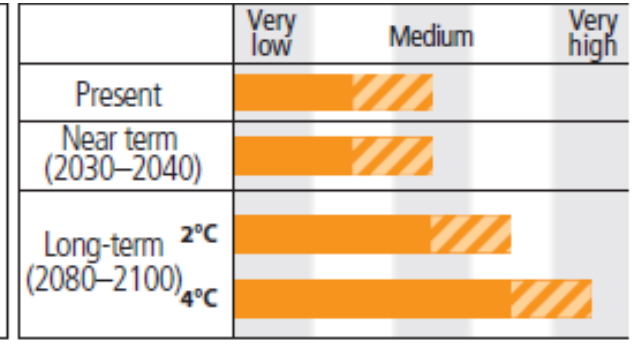
Who is most at risk from climate change in Asia?

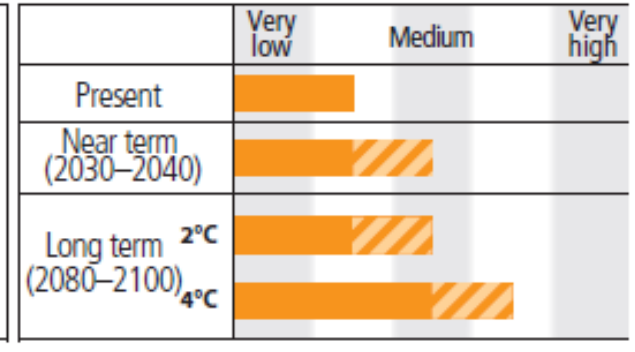
- People living in low-lying coastal zones and flood plains are probably most at risk from climate change impacts in Asia. Half of Asia's urban population lives in these areas.
- Asia is predominantly agrarian, with 58% of its population living in rural areas, of which 81% are dependent on agriculture for their livelihoods.

  Rural poverty in parts of Asia could be exacerbated due to negative impacts from climate change on rice production, and a general increase in food prices and the cost of living (*high confidence*).
- Climate change will have widespread and diverse health impacts.

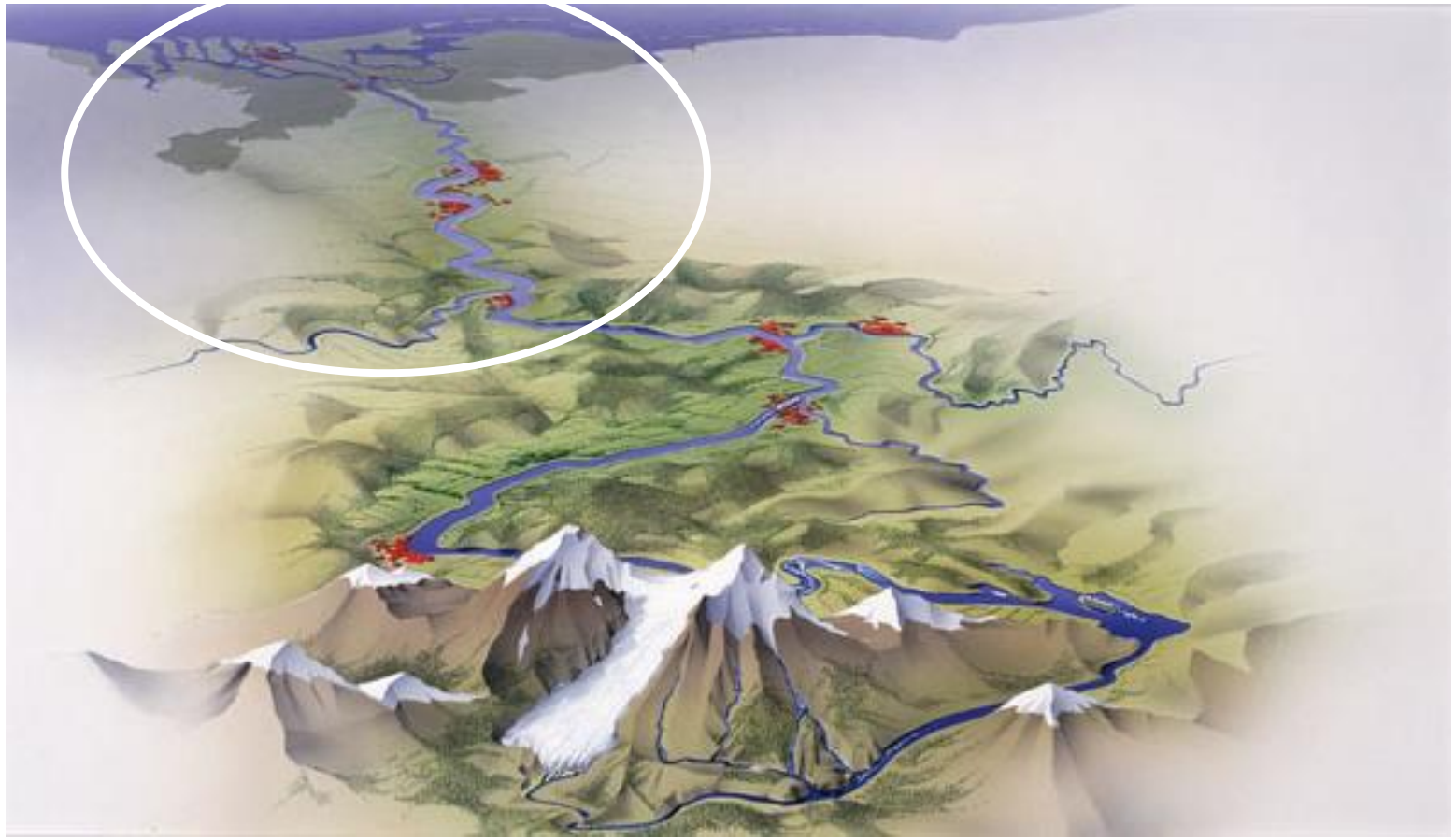
Climate-related drivers of impacts							Level of risk & potential for adaptation		
Warming trend	Extreme temperature	Extreme precipitation	Drying trend	Damaging cyclone	Sea level	Ocean acidification			
Increased risk of crop failure and lower crop production could lead to food insecurity in Asia (*medium confidence*) [24.4.4]	Autonomous adaptation of farmers on-going in many parts of Asia.								
Increased riverine, coastal, and urban flooding leading to widespread damage to infrastructure, livelihoods, and settlements in Asia (*medium confidence*) [24.4]	• Exposure reduction via structural and non-structural measures, effective land-use planning, and selective relocation • Reduction in the vulnerability of lifeline infrastructure and services (e.g., water, energy, waste management, food, biomass, mobility, local ecosystems, telecommunications) • Construction of monitoring and early warning systems; Measures to identify exposed areas, assist vulnerable areas and households, and diversify livelihoods • Economic diversification								
Increased risk of flood-related deaths, injuries, infectious diseases and mental disorders (*medium confidence*) [24.4.6.2, 24.4.6.3, 24.4.6.5]	Disaster preparedness including early-warning systems and local coping strategies.								







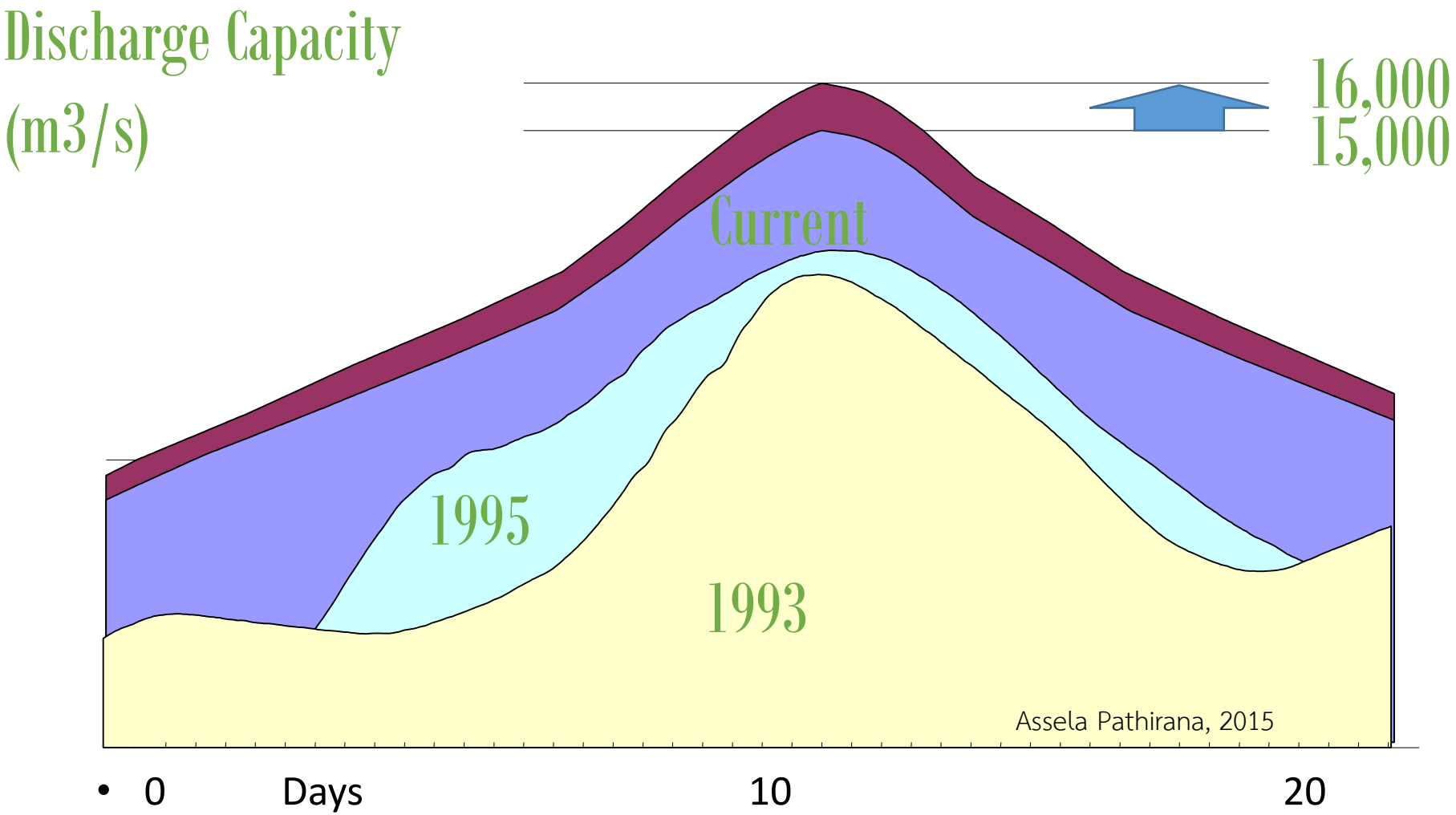
Case study: The Netherlands: Drain of Europe



Assela Pathirana, 2015

- ~ 1/3 below sea level (~2/3 flood-prone)
- 16 million inhabitants
- Assets protected against water: EUR 2,000 billion
- 25 % is surface water
- 25 % man-made reclaimed land (polders)
- One of the most densely populated delta's on the planet (400 #/km^2)

Case study: The Netherlands: Drain of Europe

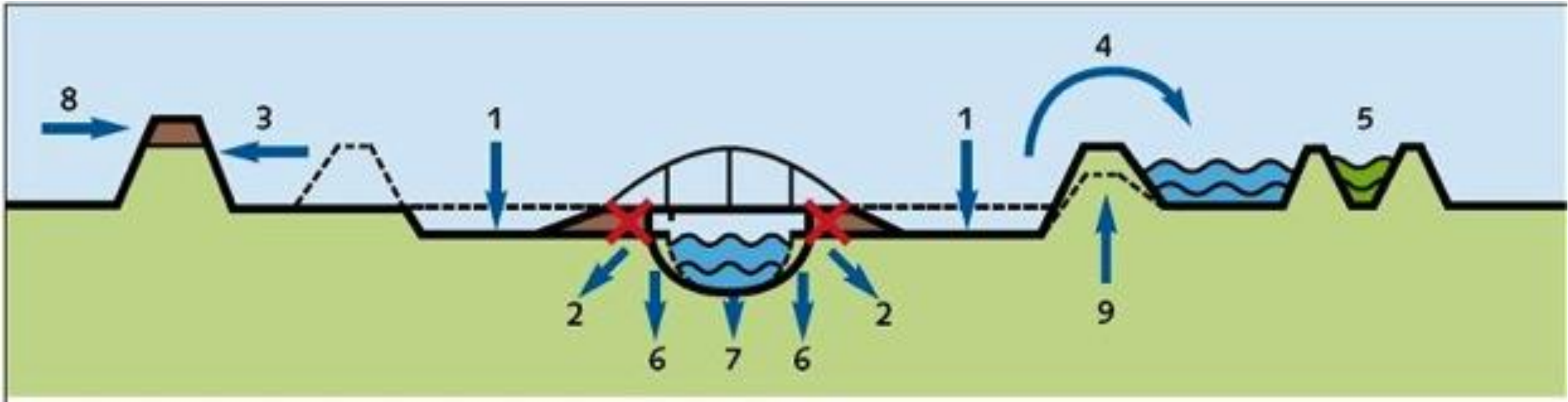


Driver

Increase Discharge Capacity of Rhine–Meuse river system up to 16,000 m3/s

Case study: The Netherlands: Drain of Europe

- Shared ownership
- Strict boundaries & roles



1 **Lowering of floodplains**	4 Waterretention and storage	7 Deepening of summer bed
2 Removal of obstacles	5 **By-pass**	8 **Heightening of dykes**
3 Dyke relocation	6 Height reduction of groynes	9 Dyke improvement

End of part I

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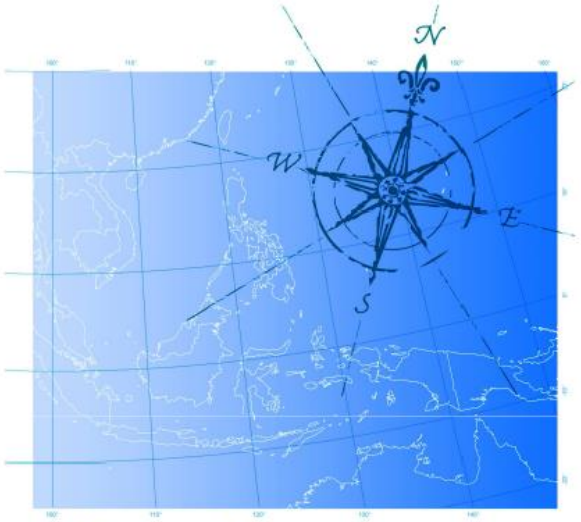

Vulnerability

Exposure

Multiple hazard risk exposure

Sensitivity

Human & ecology

Adaptive Capacity

Socio-economic
Technology
infrastructure

Climate model (AR5),
Observed data

Socio-economic model:
cohort-component, input-output model with future development plan scenarios

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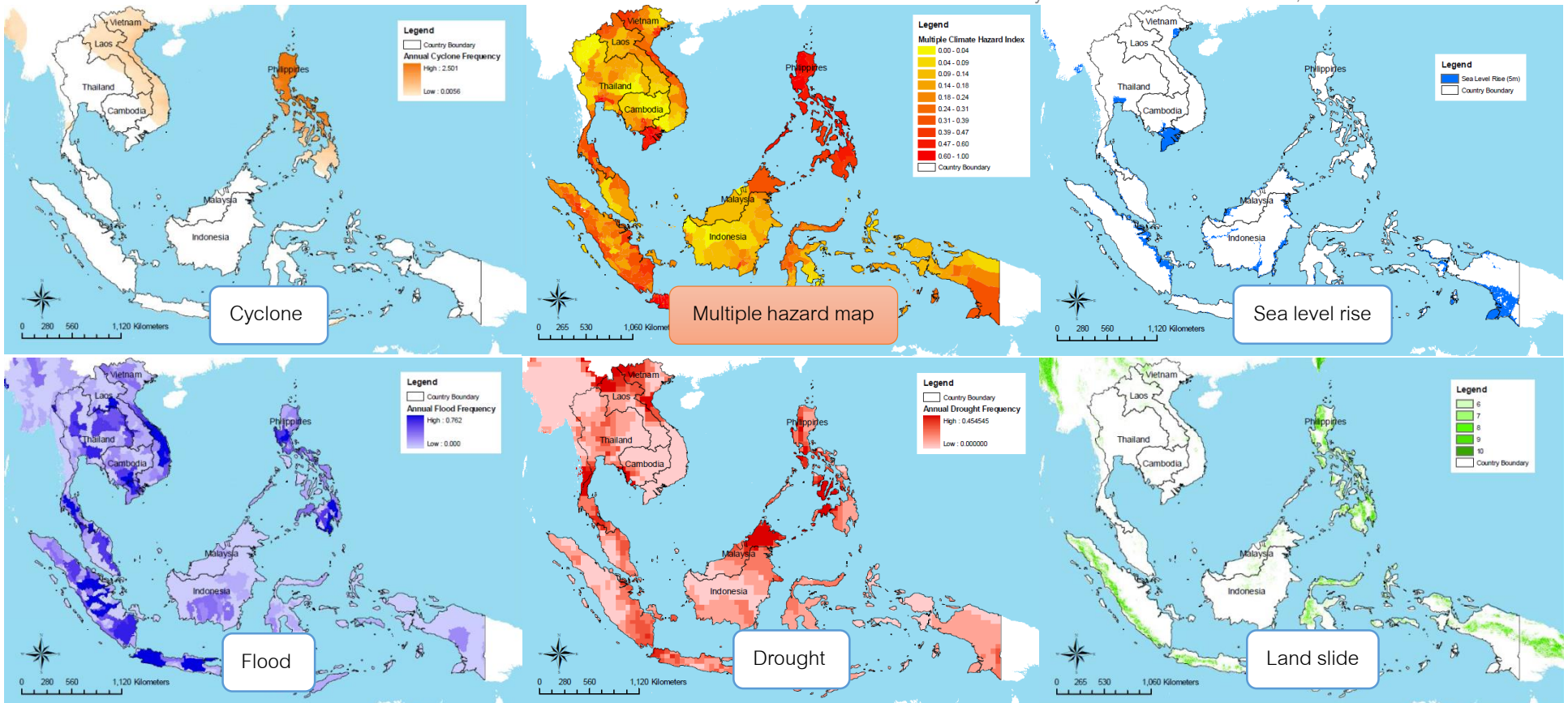
Exposure

Exposure is defined by IPCC as “the nature and degree to which a system is exposed to significant climatic variations”

Multiple hazard = f (Cyclone, Flood, Drought, Land slide, Sea level rise), weight = 0.2

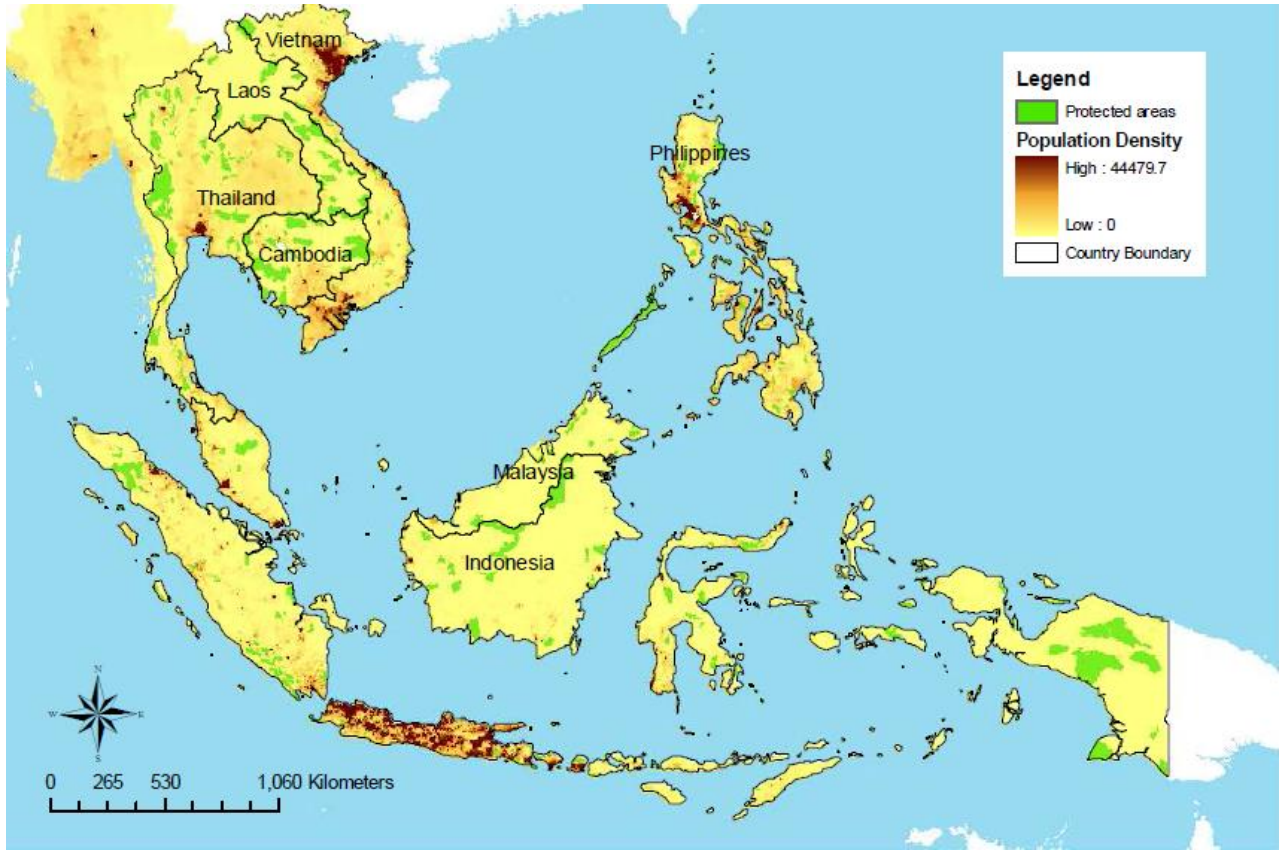
Source: Arief Anshory Yusuf & Herminia Francisco, 2009



Sensitivity

Sensitivity is defined as “the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli” (IPCC)

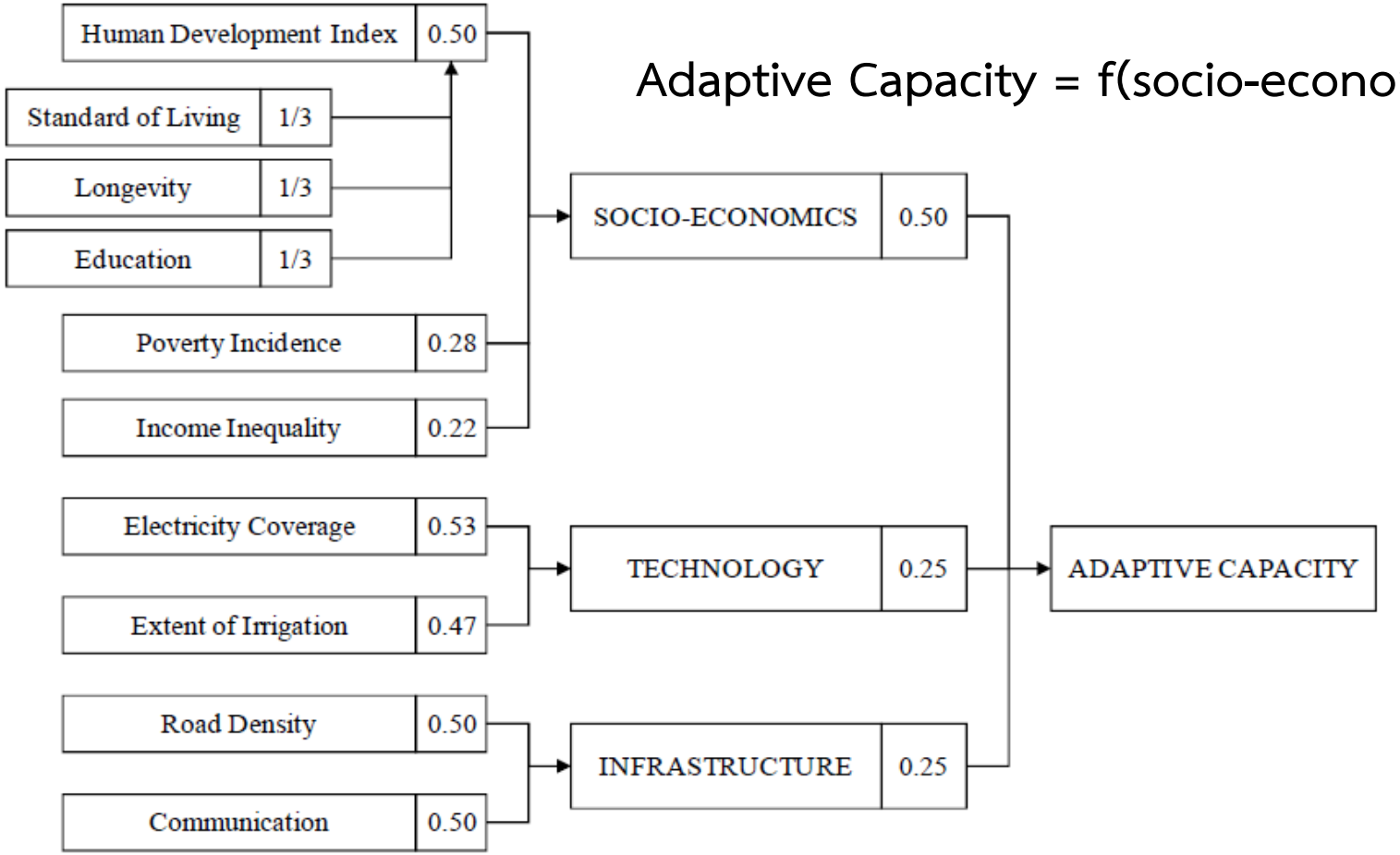
Sensitivity = f (Human & ecology), weight = 0.7, 0.3



Source: Arief Anshory Yusuf & Herminia Francisco, 2009

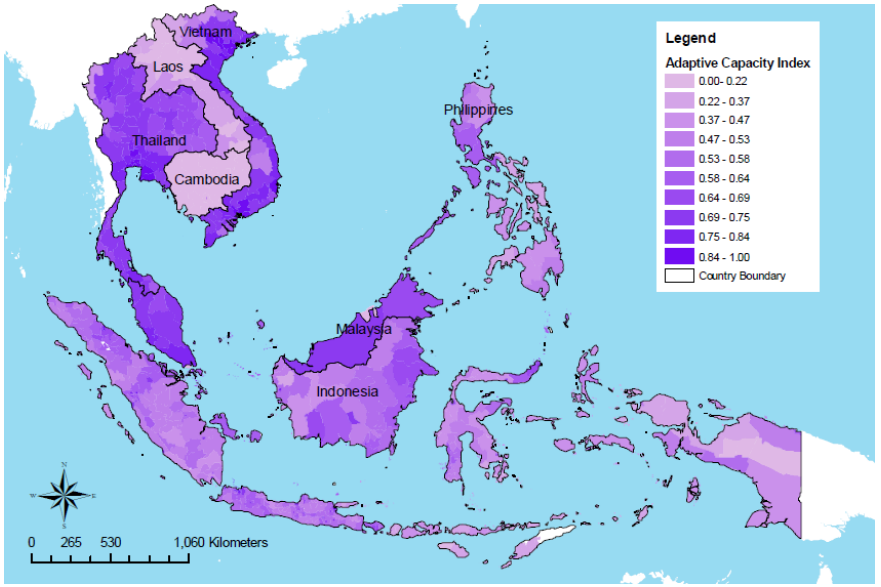
Adaptive capacity

Adaptive capacity is defined as “the ability of a system to adjust to climate change (including climate variability and extremes), to moderate the potential damage from it, to take advantage of its opportunities, or to cope with its consequences”. (IPCC)



Adaptive Capacity = f(socio-economic factors, technology, infrastructure),

weight = 0.5, 0.25, 0.25



Source: Arief Anshory Yusuf & Herminia Francisco, 2009

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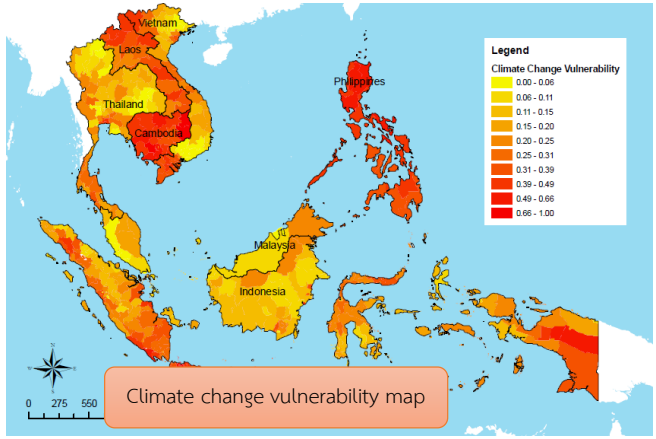
Vulnerability

Vulnerability is defined as: “The degree to which a system is susceptible to, or unable to cope with the adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity” (IPCC)

Vulnerability = f(exposure, sensitivity, adaptive capacity), weight = 1/3



Source: Arief Anshory Yusuf & Herminia Francisco, 2009