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The Economics of Climate Change in Southeast Asia: A Regional Review

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Singapore
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The logo of the Asian Development Bank (ADB), consisting of the letters 'ADB' in white serif font on a dark blue square background.

ADB



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- Study prepared by the Asian Development Bank
- But in close co-operation with UK team that produced the original Stern Review

Objectives of the Study

- ❑ Contribute to regional debate on economic costs and benefits of unilateral and regional actions on mitigation and adaptation;
- ❑ Raise awareness about the urgency of climate change challenges and their potential socioeconomic impact



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Uniqueness of Southeast Asia

- ❑ 574 million people:
 - 19% living below \$1.25/day
 - 44% living below \$2.00/day
- ❑ Fastest rate of urbanization:
 - Urban population growing at 1.6 – 4.4%
 - Occurring mostly in coastal areas
- ❑ Rank 3rd in the world in length of coastline
- ❑ Major producers and suppliers of grains, industrial crops, and forest products
- ❑ Total GHG emissions is 12% of the world in 2000

❖ SEA (4): Indonesia, Philippines, Thailand, Viet Nam



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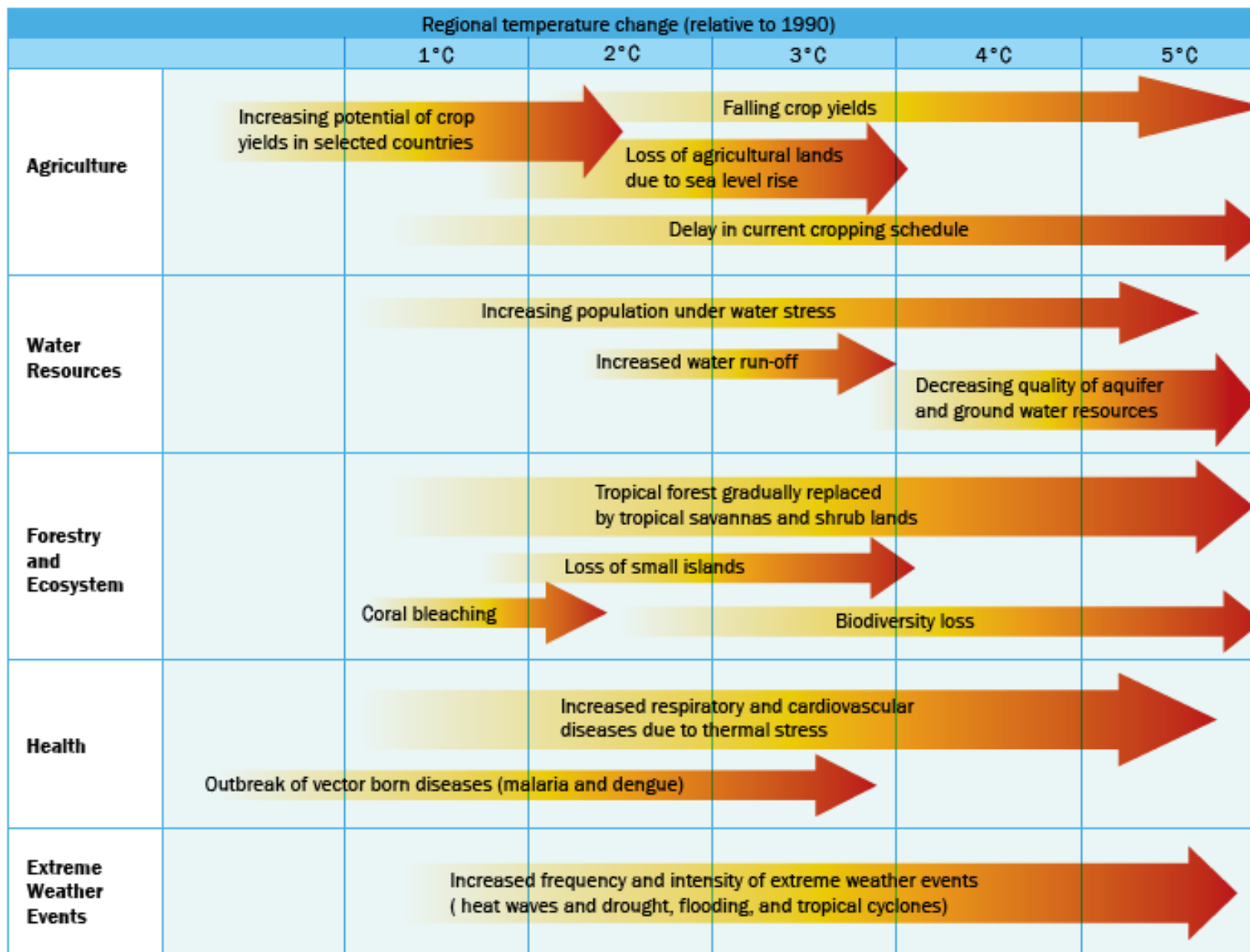
Climate Change Is Happening

- ❑ Temperature increased by 0.1 – 0.3 °C per decade
 - By 2050: 1.30 – 2.32 °C (IPCC, 2007)
 - By 2100: 2.4 – 5.0 °C (this Study)
- ❑ Precipitation decreased in many parts
- ❑ Sea level is rising 1 to 8 mm per decade
- ❑ Extreme events increasing (intensity & frequency)
- ❑ Almost all sectors are severely affected:
 - Often worth millions or billions \$
 - Large number of loss in life



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Figure H3. Potential Impacts of Climate Change on Key Sectors



Source: Adapted from Stern (2007).

Adaptation

- ❑ SEA made significant efforts.
- ❑ Adaptations in SEA are mostly reactive so far.
- ❑ The current level of adaptation is still inadequate to cope with the future challenge.
- ❑ There is an urgent need for Southeast Asia countries to develop and implement proactive climate change adaptation plans.



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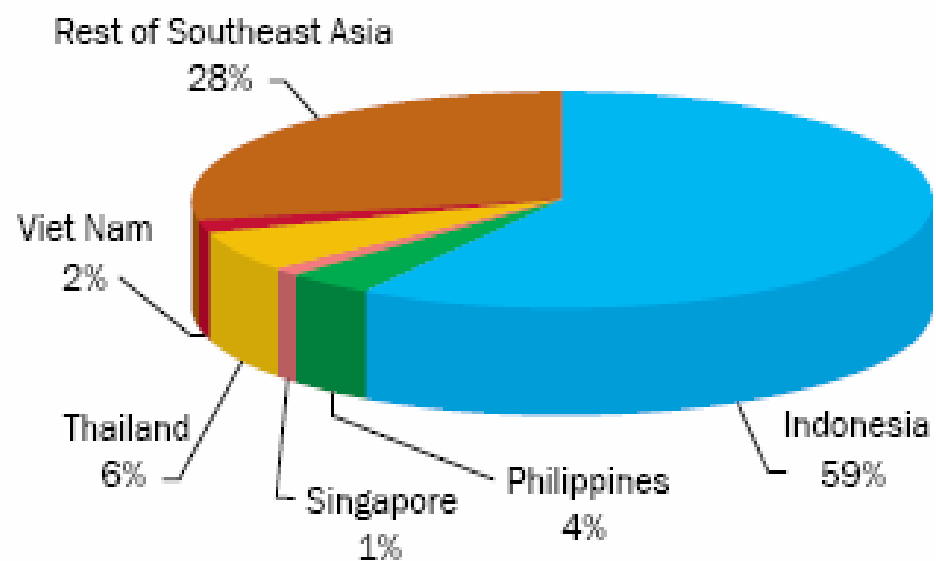
High Mitigation Potential

- Mitigation is high on the agenda in many SEA countries
- Options are available for major sources with high mitigation potential at low technology cost



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Figure H12. GHG Emissions in Southeast Asia (2000)



Note: Total GHG emissions = 5,187 MtCO₂-eq.

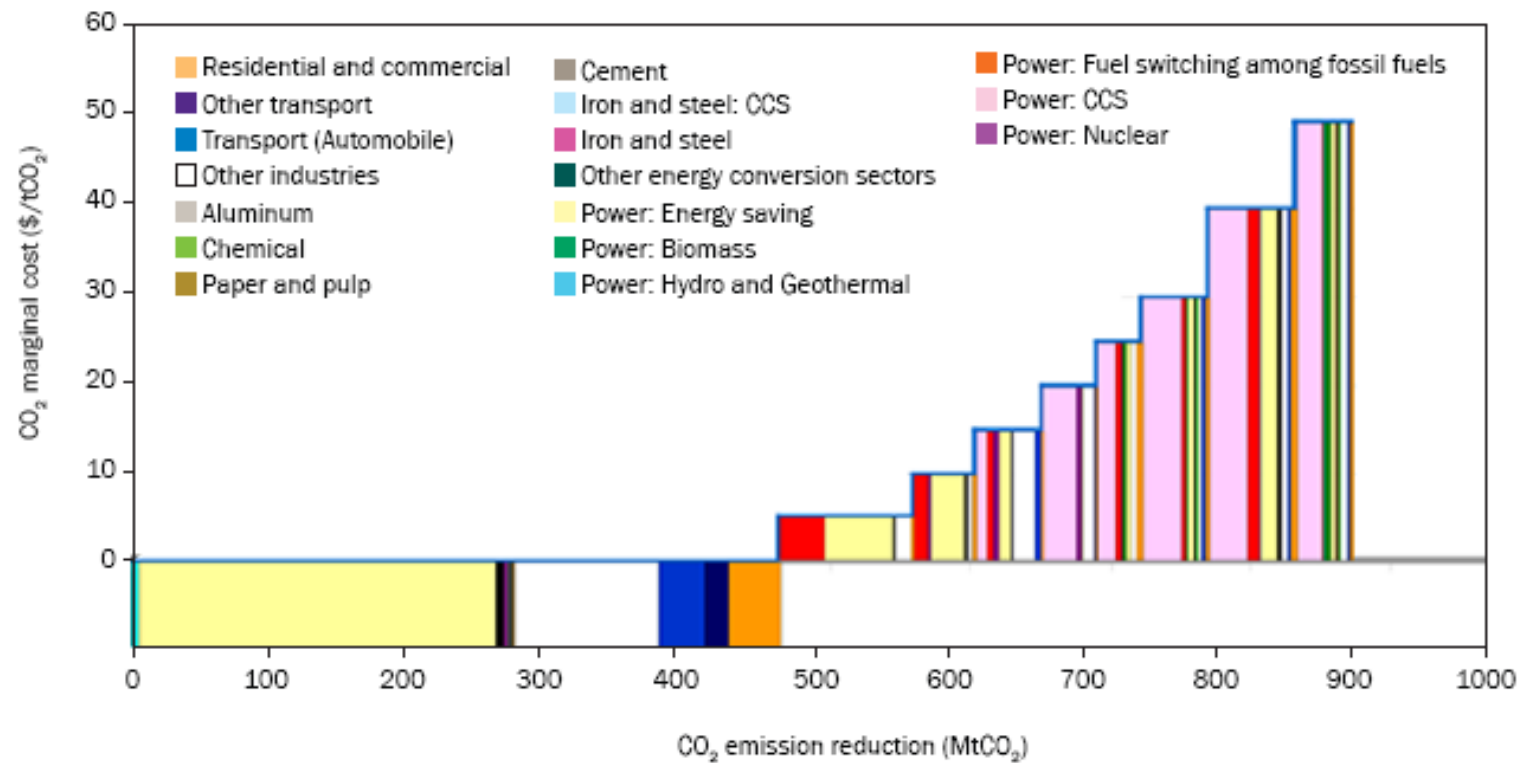
Source: CAIT Database, WRI (2008).

Win-Win Options

Energy Efficiency Improvement: SEA (4)

475 MtCO₂ with negative cost

Figure 8.12. Marginal Abatement Cost Curve for the Four Countries (2020)



Source: ADB study team.

SE Asia is more vulnerable than the global average

Figure H7. Loss in GDP (market impact only) in the Four Countries

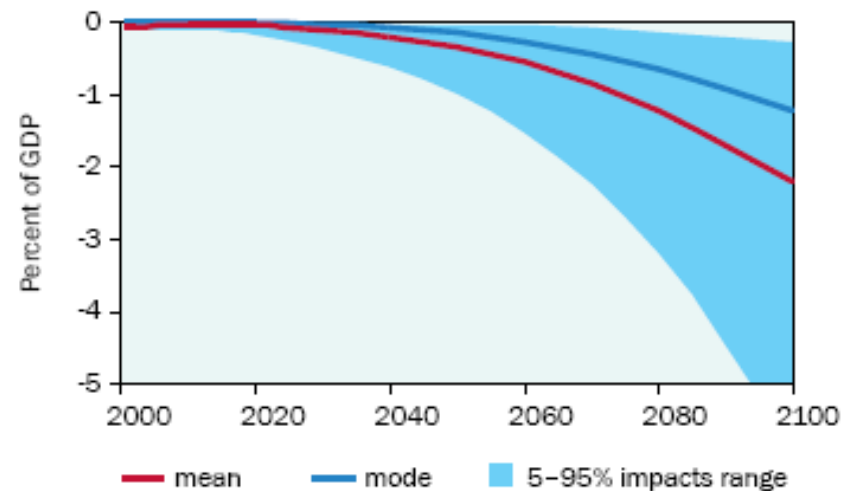
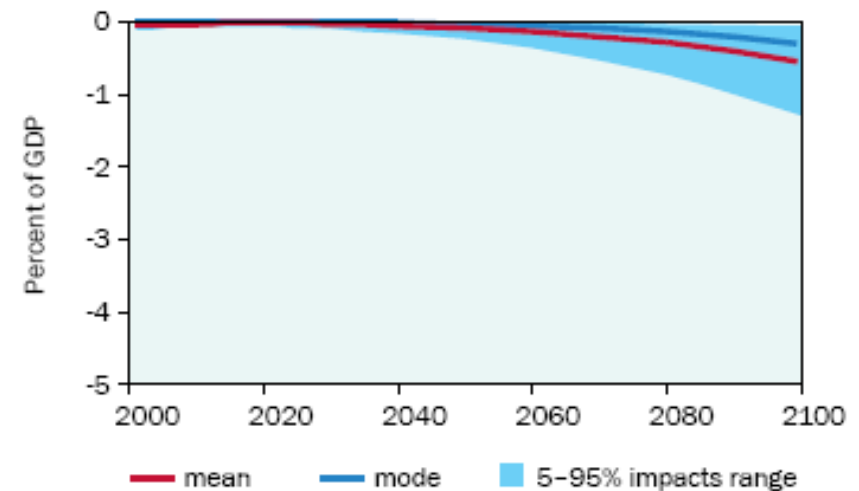


Figure H8. Global Loss in GDP (market impact only)



Note: The results are based on the A2 reference scenario without action. 'mean' indicates the average outcome of the simulations, 'mode' indicates the most likely outcome, and the range of estimates from the 5th to the 95th percentile is shaded area.

Source: ADB study team.

SE Asia could lose 6.7% of GDP by 2100, if non-market impacts and catastrophic risks are also taken into account.

Figure H9. Mean Impact in the Four Countries

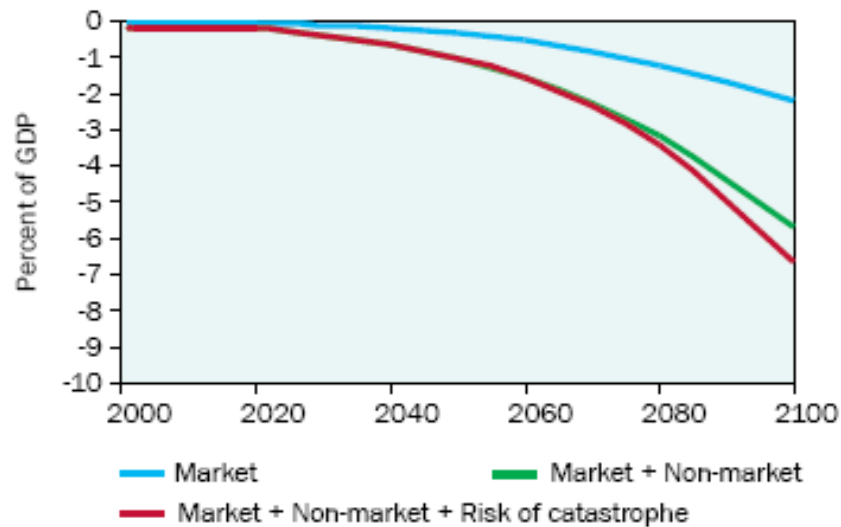
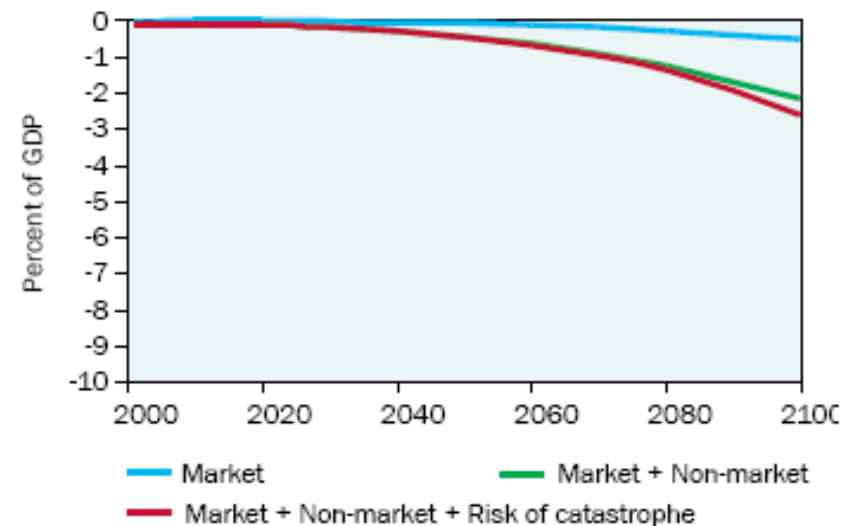


Figure H10. Global Mean Impact



Note: The results are based on the A2 reference scenario without action.
Source: ADB study team.

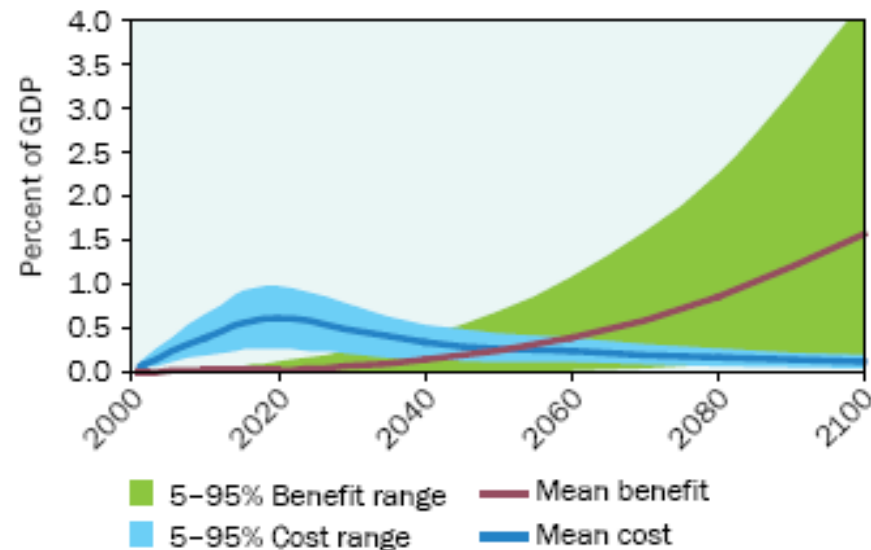
Adaptation makes economic sense:

by 2100, Benefit: 1.9% of GDP

Cost: 0.2% of GDP

GDP: Combined GDP of SEA (4)

Figure H13. Cost and Benefit of Adaptation



Note: 'mean' indicates the average outcome of the simulations and the range of estimates from the 5th to the 95th percentile is shaded area. Benefit in terms of avoided damage is based on A2 scenario.

Source: ADB study team.

Policy Implications

- ❑ Both adaptation and mitigation are necessary—identify win-win options
 - Planting mangroves sequesters carbon and buffers the effects of storm surges on infrastructure near the coast
 - Water storage can be beneficial for flood risk reduction, drought response and clean energy generation (hydro)

- ❑ Essential to enhance adaptive capacity
 - R&D/technology: Drought and saline resistant crops, Efficient irrigation techniques, Water conservation technologies, Improved farming systems/practices
 - Infrastructure: Climate-proofed, Strengthen risk and vulnerability assessment
 - Weather data collection and forecasts, Early warning systems, Knowledge development and dissemination



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Key Messages

- ❑ Climate change is already affecting Southeast Asia, and the worst is yet to come.
- ❑ Region could suffer damages equivalent to more than 6% of GDP by 2100, more than two times as high as the global average.
- ❑ Southeast Asia should contribute to the global solution, by implementing both adaptation and mitigation measures.



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Key Messages

- ❑ Southeast Asia should make greater mitigation efforts
- ❑ Low carbon growth brings significant co-benefits, in particular, by reducing emissions from deforestation and degradation, implementing win-win mitigation options in the energy sector, and exploring mitigation potential of the agriculture sector.
- ❑ International funding and technology transfer are essential. The region should enhance its capacities to make better use of the existing and potential international funding sources.



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Key Messages

- ❑ Regional cooperation offers effective means to deal with many cross-boundary issues, such as water resources management, forest fires, extreme weather events, and outbreak of diseases.
- ❑ Climate change issues cut across many sectors, and Southeast Asia countries should strengthen policy and planning coordination among different ministries and levels of government.
- ❑ Urgent need for more research to better understand climate change challenges, in particular at the local levels, and cost effective adaptation and mitigation solutions.



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Key Messages

- ❑ Green Stimulus: Southeast Asian countries could address the dual threats of climate change and the global financial crisis by introducing 'green stimulus' programs
- ❑ These can simultaneously strengthen economies, create jobs, reduce poverty, lower emissions and help prepare for the worst effects of climate change.



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ADB Review of the Economics of Climate Change in S E Asia

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