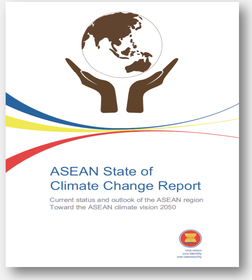
# Critical enabling conditions to realise a net-zero climate resilient development pathway in four ASEAN Member States

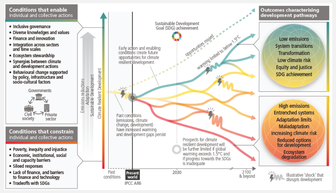
Yosuke Arino* ・ Prabhakar S.V.R.K., Chisa Umemiya, Makino Yamanoshita, Temuulen Murun, Naoyuki Okano / Institute for Global Environmental Strategies

## Introduction

- Some ASEAN countries (e.g. Singapore, Indonesia, and Thailand) have already announced **long-term strategies (LTS)** that include net-zero targets and pathways, and ASEAN has a climate vision 2050 for a **resilient net-zero transition.**
- The concept of the **Climate Resilient Development Pathway (CRDP)** has been advocated by scientific communities after the AR5 (IPCC, 2014).
- However, the CRDP remains a concept and little is known on how **net-zero transition** and **CRDP** can be synergized.
- This research aims to identify **critical enabling conditions for a net-zero CRDP** in the context of four major **ASEAN countries.**



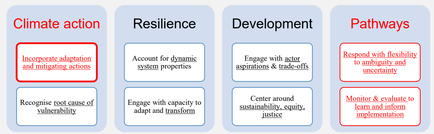

Source: ASEAN Secretariat (2021)




Source: IPCC (2023) AR6 Synthesis Report, Figure SPM.6

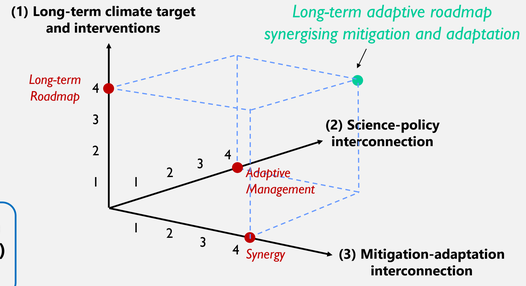
## Methods

- We selected **four ASEAN countries** (Indonesia, Philippines, Thailand, and Vietnam), considering variations in the development status of mitigation and adaptation policy.
- Based on the literature review & interview survey, we extracted **key elements of CRDP** and **critical enabling conditions** for a net-zero transition along CRDP by integrating mitigation and adaptation interventions in LTS, etc.




**Critical enabling conditions**

**(1) Long-term climate targets and interventions (incl. roadmap)**
**(2) Science-policy interconnections (incl. adaptive management)**
**(3) Mitigation-adaptation interconnections (incl. synergy)**




**Evaluation framework of policy for enabling net-zero CRDP**

## Results

**Long-term climate goal and pathway with a focus on science-policy interconnection**

| Country/ Region | Climate goal/ Pathway | | Mitigation | Adaptation | Mitigation & Adaptation | Documents |
|---|---|---|---|---|---|---|
| ASEAN | Climate goal | | Net-zero GHG emissions as soon as possible after 2050 (ASEAN climate vision 2050); science-based target | Ensuring adaptation transition's synergy with the mitigation transition toward net-zero emissions | Synergising mitigation and adaptation, wherever possible toward net-zero emissions | ASEAN State of Climate Change Report (ASCCR) |
| | Pathway | Long-term projection | GHG emission pathway based on model Inter-comparison project's database (CD-LINKS) | Climate impact (risk) assessment by AP-PLAT; qualitative adaptation actions until 2030 and 2050 | Actions until 2030 and 2050, not based on scientific tools; no strategy/plan | ASCCR |
| Indonesia | Climate goal | | Net-zero GHG emissions by 2060; science-based target | Climate resilience ("low carbon and climate Resilience"; p.1) | Importance of synergy between climate change mitigation and adaptation | LTS |
| | Pathway | Long-term projection | Integrated Assessment Model (IAM): Asian-Pacific Integrated Model (AIM) | A stepwise process to identify goals and analyse potential problems and actions based on temporary scenarios | N/A | LTS |
| Philippines | Climate goal | | No goal of net-zero | Not explicitly defined for entire nation; case by case for subnational areas | N/A | CLUP GUIDEBOOK: A Guide to Comprehensive Land Use Plan Preparation 2014, Volume 2 |
| | Pathway | Long-term projection | N/A | Climate and Disaster Risk Assessment (CRDA) | N/A | CLUP GUIDEBOOK: A Guide |
| Thailand | Climate goal | | Net-zero GHG ($CO_2$) emissions by 2065 (2050); science-based target | Climate-resilient development (Foreword) | Vision of long-term low GHG emission and climate-resilient development pathway; not based on scientific tools | LTS (LT-LEDS) |
| | Pathway | Long-term projection | IAM: AIM; science-based target | The ensembled result of 3-model study: MPI-ESM-MR, EC-Earth, and HadGEM2-ES | N/A (But there is a table to compare mitigation and adaptation measures by sector | LTS (LT-LEDS) |
| Vietnam | Climate goal | | Net-zero GHG ($CO_2$) emissions in the power sector by 2050; science-based target | Minimising disaster risks as part of climate change adaptation on electricity infrastructures | N/A | National Electricity Development Master Plan VIII |
| | Pathway | Long-term projection | IAM: AIM: science-based target | N/A | N/A | National Electricity Development Master Plan VIII |

**(1) Long-term climate target and interventions**

Scores 1-4 for Overarching, Adaptation and Mitigation: Score 1: no long-term climate target nor interventions, 2. either, 3, Both, Score 4: Time-bound interventions (i.e. **Roadmap**)

**(2) Science-policy interconnection**

Scores 1-4 for Overarching, Adaptation and Mitigation: Score 1: no model nor M&E, Score 2: Either, Score 3: Both, Score 4: **Adaptive management**

**(3) Mitigation-adaptation interconnection**

Score 1: Separation
Score 2: Complementarity
Score 3: Co-benefits/Trade-offs
Score 4: **Synergies**

**Climate Policy LTS, etc*.**

*Vietnam's (3) considers its NDC. Philppines' (1)-(3) consider the National Climate Risk Management Framework .


**Energy Policy***

*Examined policy targeting after 2030.


**Agriculture Policy***

*Examined policy targeting after 2030.


- ► LTS, etc. more focuses on mitigation than adaptation and overarching areas.
- ► Synergies are not well recognized nor well defined as policy targets or interventions.
- ► Indonesia and Thailand lead the science-based roadmap development in LTS but still room for adaptive management and synergies.

- ► Energy policy more focuses on mitigation than adaptation and overarching areas.
- ► Adaptation synergy in the energy sector is well recognized in the Philippines, but neither adaptation nor synergies are well defined as policy targets or interventions.
- ► Science on adaptation of energy infrastructures is not integrated in policy.

- ► Agriculture policy mainstreams mitigation and adaptation almost equally,
- ► Adaptation-mitigation co-benefits are recognized in three countries, but synergies are not well recognized. Thailand and Vietnam show policy targets and interventions in overarching area.
- ► Science-policy interconnection is slightly stronger for adaptation than mitigation.

## Conclusions

- LTS mainly focuses on mitigation; and synergies of mitigation and adaptation are not well defined as policy targets or interventions in ASEAN countries, while synergies are recognized in most countries.
- Integrated Assessment Models (IAMs) and climate models played vital roles in most countries, but there is room for scientific advancement in mitigation-adaptation synergy and adaptive management to respond to future uncertainties.
- In the energy sector, adaptation is not an explicit policy target as in the case of agriculture sector. A clearer target for adaptation in the energy sector is needed. Synergies are well recognized in the Philippines. In the agriculture sector, synergies are not recognized but co-benefits or trade-offs are well recognized.
- Science-based targets and interventions for synergizing mitigation and adaptation are a critical missing element and are necessary for both climate policy (e.g. LTS) and sectoral policy. Science on the synergy among mitigation-adaptation-development is vital.

## Acknowledgements


- ► The research project on the long-term roadmap to synergize mitigation and adaptation is supported by the Environment Research and Technology Development Fund (JPMEERF20221C06) of the Environmental Restoration and Conservation Agency provided by MOEJ.
- ► Authors thank discussants and participants for constructive suggestions at the 11th and 12th Congress of the Asian Association of Environmental and Resource Economics held in 2022 and 2023 respectively, and IPCC Symposium in Tokyo in March 2024