

Southeast Asian resilience in agriculture and biodiversity:

Experts dialogue on the impacts of climate change and enhancing resilience in the region

EXECUTIVE SUMMARY

At the 2019 Asia Pacific Climate Week in Bangkok, Southeast Asian experts called for stronger collaboration on climate science research and discourse in the region focused on resilience. A panel of experts from Indonesia, the Philippines, Vietnam, and Thailand discussed the science and adverse impacts of climate change in the most predominant sectors in the region—agriculture and biodiversity.

The experts expressed concern that complacency in meeting mitigation targets necessary to keep global warming to within the narrow 1.5 degree Celsius limit may disrupt agricultural production and biodiversity conservation which may adversely affect the region's food security.

The IPCC's special report on climate change and land (2019) posited that agriculture usage covers 23% of land and 70% of water from available resources. Further, agriculture also accounts for 13% of nitric oxide emissions, 44% of methane emissions, and 82% of nitric oxide emissions from human activities globally, which has massive implications on land. In fact, one of the impacts of using land for agriculture accounts an 11 to 14 percent of biodiversity loss. Despite its contributions to climate change, both agriculture and biodiversity are also greatly affected by climate impacts.

For instance, in Thailand, agriculture is recorded as the second largest greenhouse gas (GHG) emitting sector with almost 60% of emissions from rice production. Further, the country also experienced drought across 26 provinces. In Thailand and the Philippines, studies show that an 8 to 10 percent decrease in rice yield is recorded for every 1 degree Celsius increase in temperature. In Vietnam, especially in the Mekong Delta area, it was observed that saline water intrusion during the dry season led to the occurrence of drought and acidic soil and irrigation systems.

In the area of biodiversity, between 15 to 21 million hectares representing the majority of the tropical peat in Southeast Asia is found in Indonesia. These are extremely important for carbon and water storage and consists of both aquatic and terrestrial ecosystems that are very rich in biodiversity. Global warming and the changes in rainfall intensity and frequency are detrimental to tropical peat. However, these mostly suffer from anthropogenic disturbances such as land

use change, large carbon emission due to rapid decomposition of organic matter, and recurrent fires on dry peat which pollute major cities with transboundary haze.

Given these facts, what can we do about it? The experts on the panel further explained the implications of climate impacts on the adjustments needed in national and local development strategies. The ultimate goal of the Paris Agreement is to keep the warming to only 1.5 degrees Celsius. Research, including that of the IPCC, on global and regional scenarios and projections support this, stating that there are projections already exceeding the 1.5 degrees Celsius limit and the window of opportunity to maintain this limit is narrowing. The experts stressed that varying scenarios depend on the socioeconomic pathways that are built into development plans, and concrete actions are urgently needed. If we cannot demand this of our policymakers, at the very least we can try to develop resilience strategies.

Agriculture, as an important sector for food security and biodiversity conservation, is equally important in the region. In the forum, the experts presented locally-driven initiatives that can serve as policy recommendations in climate policy development and stakeholder engagement to strengthen resilience building in the region:

1. Technology development and research advances the challenges in agriculture and biodiversity

Experts recommend the most efficient strategies to adapt to the impacts of climate change in agriculture is to increase crop productivity and systems while ensuring low carbon emissions, which will reduce the stress on land and biodiversity use. Preservation and restoration efforts are practiced for biodiversity conservation.

Climate smart agriculture practices such as Vietnam's participatory plant breeding (PBB) method and the 1M6R model (technical innovation for rice cultivation) that encourages a shift from conventional to low-emission farming and improved crop resistance or tolerance to drought. These methods ensured seed security and adaptation to unfavorable conditions in the Mekong Delta region.

Thailand's Nationally Appropriate Mitigation Actions (NAMA) on rice production increased through adaptation technological innovations, while reducing farm investment costs. These include land leveling, alternate wetting and drying, site-specific nutrient management, and straw and stubble management.

The Smarter Approaches to Reinvigorate Agriculture as an Industry, or Project SARAI, used a mix of satellite data generation and crop field modeling and management in the Philippines. This initiative improved the data generated on drought and crop assessment that provided solutions for more productive and proactive farming.

About 1.7 million hectares of the degraded peat in Indonesia are located in oil palm and timber plantations, while the rest are located in public lands and protected areas. The restoration efforts consist of three main actions such as rewetting, revegetation, and revitalization.

These practices are guided by continuous research, field simulations, and training by the experts and their partners. These produced positive results that can be replicated and practiced by farmers and foresters in other localities and countries.

2. Climate policy development and finance windows

While there are locally-driven climate-smart initiatives in agriculture and biodiversity conservation, the experts emphasized that policy action and government support are needed to ensure the sustainability and enhancement of these programs.

For instance, NAMA's five-year plan (2018-2023) has enabled 100,000 rice farming households in Thailand from conventional to low cost and low emission farming. Project SARAI didn't only produce over a hundred of researches on the Philippines' major crops with state universities, but the program was also adopted by the country's national government agencies. The peat restoration program in Indonesia was supported by the Peatland Restoration Agency (Badan Restorasi Gambut-BRG), a government body that targeted over 2.67 million hectares of peatland restoration in five years (2016-2020).

In terms of finance, dedicated funds from the government blended with private institution pledges can stimulate program implementation. Further, risk transfer mechanism options such as insurance are viable additional finance mechanisms especially in agriculture.

Nation-wide programs can be incorporated in long term climate adaptation and mitigation plans of national governments and local communities. For instance, linking institutions with the stakeholders on research improves the participatory nature of decision making involving local champions, which increases the readiness of a community or country in developing and implementing climate-smart programs. These should be supported by science and evidence-based vulnerability assessment to ensure that policies and programs target the climate-induced impacts.

3. Strengthening stakeholders' engagement to enhance resiliency in the region

Experts emphasized long-term stakeholder engagement through capacity building as a means to enhance resiliency. Such an engagement includes an assessment of gaps and needs, action formulation, implementation of actions, and evaluation of those actions to ensure responsiveness to the needs of the stakeholders while increasing their resilience.

Building a network of experts in the region would stimulate knowledge building on climate science and the impacts of climate change. The experts, who mostly also come from the ranks of the academe, are key actors in enhancing capacity as the major source of knowledge. In stakeholder engagement, it is also important to involve practitioners in other fields of study such as in policy, economics, sociology, journalism, health, among others, to communicate and complement the science and evidence-based knowledge needed in the climate discussions.

As the experts said, "the numbers don't lie." While climate change is a global issue, its impacts are local, hence, solutions are also local. But a regional discussion on best practices in research and policy can also improve the capacity of stakeholders and countries. The forum reiterates the importance of a regional network that will bring forward the discourse on climate change as a means to collectively enhance our resiliency.

About the Asia Climate Experts (ACE) Network

The ACE Network is a network of scientists and groups working on climate science and the impacts of climate change on long-term development strategies in the region. These development strategies focus on food security, agriculture, peatland conservation, land-use, biodiversity, climatology, and capacity building. The group was formed in September 2019 at the Asia-Pacific Climate Week in Bangkok, Thailand.



The founding members of the ACE Network:

- **Gusti Zakaria Anshari**—IPCC Author (recent contribution on the Working group II to the 6th Assessment Report (AR6)—Chapter 2: Terrestrial and freshwater ecosystems and their services); Universitas Tanjungpura, Indonesia
- **Mahawan Karuniasa**—Chairman, Indonesia Expert Network for Climate Change and Forestry (APIK Indonesia Network) ; Paris Committee for Capacity Building (PCCB) member and Lead of the Working group 4
- **Felino P. Lansigan**—IPCC Author (Working group II to the 2014 5th Assessment Report (AR5)—Impacts, Adaptation, and Vulnerability); Dean of the College of Arts and Sciences, University of the Philippines Los Baños; Member of the National Panel of Technical Experts of the Climate Change Commission of the Philippines
- **Ir. Sabaruddin**—University of Sriwijaya, South Sumatra; Indonesia Expert Network for Climate Change and Forestry (APIK Indonesia Network)
- **Lourdes V. Tibig**—IPCC Author (recent contribution on the Special Report on Oceans and the Cryosphere); Member of the National Panel of Technical Experts of the Climate Change Commission of the Philippines
- **Huỳnh Quang Tín**—Head of Department and Senior Lecturer, Department of Plant Breeding and Plant Genetic Resources Conservation, Mekong Delta Development Research Institute, Can Tho University, Vietnam
- **Duangporn Vithoonjit**—Agronomist, Rice Research Center, Chai Nat, Thailand

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