Integrated Training Program and Workshop

Climate Smart ASEAN: *Assessing Climate Vulnerability, Planning Adaptation Strategies, and Securing Innovative Financing*

2-6 September 2024

Outcome Document

Background

1. ASEAN member states (AMS) have suffered significantly increasing climate extremes in recent years with complicated occurrences of typhoons, floods, droughts, and other extreme events. Although ASEAN has actively implemented Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) initiatives at all levels, loss and damage still occur and severely affect vulnerable communities. Recognizing the risk of dealing with climate change vulnerability, ERIA in collaboration with Lao PDR organized an integrated training program and workshop on building climate-smart ASEAN.

2. The integrated program recognized that delaying adaptation measures will lock in future losses and increase the severity of climate impacts. The imperatives of building climate-smart ASEAN are critical for the following reasons (i) Safeguarding economies: Climate change is projected to cost ASEAN member states about 6-9% of GDP in 2050. Implementing adaptation strategies can protect infrastructure, ensure food security, and minimize economic losses (ii) Protecting lives and livelihoods: Adaptation can help mitigate the social impacts of climate change. Early warning systems, improved disaster preparedness, and climate-smart agriculture can safeguard lives and livelihoods; and (iii) Building a resilient and sustainable future: Effective adaptation fosters long-term resilience, enabling ASEAN to navigate a changing climate and increasing disaster events while pursuing sustainable development goals.

Vulnerability Assessment: Identifying Risks and Prioritizing Actions

3. The ASEAN region, characterized by its diverse agroclimatic zones and increasing vulnerability to climate change, faces significant challenges in ensuring food security and sustainable agricultural practices. Crop simulation models, sophisticated computational tools that simulate the growth and development of crops under various environmental conditions, offer a promising solution to these challenges. By providing valuable insights into crop performance, resource use efficiency, and climate change impacts, these models can play a pivotal role in building a climate-smart ASEAN. Crop models, such as CLASSIM, incorporate a range of factors including temperature, precipitation, radiation, soil properties, and crop genetics to predict crop yields, water use, nutrient uptake, and other key agronomic parameters. These models can be used to assess the impacts of climate change on crop production; identify climate-resilient crop varieties;

optimize irrigation and fertilization practices; and develop sustainable land management strategies. By simulating crop growth under projected climate scenarios, these models can help policymakers and farmers better understand the potential consequences of rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events. This information can be used to develop adaptation strategies, such as shifting heat-tolerant crop varieties, improving water management systems, and promoting agroforestry practices.

4. To mitigate climate risks and build a more resilient ASEAN, hydrological models have emerged as indispensable tools for planning and early warning systems. Hydrological models such as Mike+ for rainfall runoff and river hydrodynamics are computational representations of the water cycle, simulating various processes such as precipitation, runoff, infiltration, and evaporation. They can provide valuable insights into the behavior of water systems under different conditions. Hydrological models can also be used to evaluate the potential impacts of infrastructure projects, such as dams, irrigation systems, and urban development on water resources. This information can help ensure that these projects are designed and implemented in a resilient manner, minimizing negative environmental and maximizing social benefits. Hydrological models can also serve as the foundation for effective early warning systems, providing timely information on potential water-related hazards.

5. Key components of crop and hydrological models include (i) Real-time data collection. Gathering data on rainfall, streamflow, and other relevant parameters in real-time is essential for accurate model predictions. This can be achieved through a network of sensors and automated data collection systems; (ii) Model integration: Incorporating crop and hydrological models into early warning systems allow for the prediction of potential hazards based on current conditions and forecasted weather patterns; (iii) Communication and dissemination: Developing effective communication channels to disseminate modelling results to relevant stakeholders, such as policymakers, infrastructure designers, and farmers is crucial for ensuring that people are aware of the potential climate risks and can take appropriate climate-smart actions; (iv) Assessing the socio-economic factors that affect climate risks. Assessing the socio-economic factors that influence vulnerability and climate risks, such as poverty levels, access to rural resources, social capital and governance structures of rural resilience will help identify populations most at risk and inform equitable adaptation planning aided by government policies.

From Vulnerability and Resilience: Planning Adaptation Strategies

6. Climate resilience is a pressing development challenge for ASEAN, demanding innovative and effective adaptation strategies. By examining successful initiatives from diverse regions, ASEAN member States can get valuable insights. The followings are case studies that offer valuable lessons for building effective climate change adaptation strategies:

6.1 Japan's experience with frequent natural disasters has led to the development of robust disaster resilience and early warning systems. These systems, characterized by advanced technology, comprehensive planning, and public awareness campaigns, have effectively mitigated the impacts of disasters and climate risks. Lessons learned include timely and progressive Investing in advanced technologies to monitor weather patterns and issue timely alerts; designing infrastructure with minimum standards to withstand extreme weather events; and promoting disaster preparedness education and fostering a culture of resilience.

6.2 The minor irrigation tanks of South India have played a crucial role in adapting to climate change by providing a reliable water source for agriculture. These ancient water management systems have demonstrated their resilience to droughts and floods. Key lessons include implementing efficient water management practices to conserve water resources; empowering local communities to modernise, manage, and maintain irrigation systems; promoting the cultivation of drought-tolerant crops, and adopting agroforestry practices.

6.3 Korea's climate-smart agriculture approach has focused on developing sustainable farming practices that are resilient to climate change. Key strategies include the use of sensors and data analytics to optimize resource use, reduce waste, and improve crop yields; real-time monitoring of weather conditions enables farmers to make informed decisions regarding irrigation, pest control, and crop management; and automation of tasks such as planting, harvesting, and packaging reduces labour costs and increases efficiency.

6.4 Japan's experience with paddy field land consolidation offers valuable insights into the benefits of large-scale agricultural operations in adapting to climate change. By consolidating small plots of land into larger, more efficient units, farmers can increase the use of machinery to improve productivity and reduce labour costs. Investment in improved irrigation and drainage systems helps in enhancing disaster resilience. Pooling resources to manage climate risks and access insurance mechanisms against disasters improves resilience.

6.5 The National Adaptation Plan (NAP) of Lao PDR provides a comprehensive framework for addressing climate change challenges. Key elements of the NAP include (i) Identifying climate-vulnerable sectors and communities; (ii) developing a range of adaptation measures tailored to specific needs; and (iii) strengthening sectoral capacity to implement adaptation actions. Fostering collaboration among government agencies, non-state actors, and local communities is crucial for a successful adaptation plan and implementation of adoption plans. By drawing on the lessons learned from these initiatives, policymakers and practitioners in AMS can develop effective climate change adaptation strategies that are tailored to local contexts and capable of addressing the challenges posed by climate vulnerability.

Unlocking Resources for Resilience: Securing Innovative Financing

7. Building climate resilience in ASEAN demands innovative and sustainable finance solutions. While traditional financing methods are crucial, new approaches are essential to address the scale and urgency of climate adaptation and resilience efforts. Land value capture (LVC) is a strategy that involves capturing the increased value of land resulting from public investments in infrastructure or new development infrastructure like water retention basins as practice in ancient Japan. This captured value can be used to fund climate adaptation projects, such as green infrastructure, flood control measures, and sustainable urban planning. For instance, cities can implement a tax on land value increases associated with new transportation infrastructure or zoning changes, with the revenue allocated to climate resilience initiatives.

    7.1 Along with land value capture, blockchain technology offers a decentralized and transparent platform for crowdfunding, which can be leveraged to mobilize funds for climate adaptation projects. By enabling secure and efficient transactions, blockchain can facilitate crowdfunding campaigns for community-based initiatives, such as renewable energy projects, sustainable agriculture, and disaster preparedness. This can empower local communities to take ownership of their climate resilience efforts and attract global support.

    7.2 Carbon pricing mechanisms, such as carbon taxes and emissions trading schemes, impose a cost on carbon emissions. This creates a financial incentive for businesses and individuals to reduce their carbon footprint and invest in climate-friendly technologies. The revenue generated from carbon pricing can be used to fund climate adaptation projects, research, and development. By implementing effective carbon pricing mechanisms, governments can enhance climate resilience. Carbon markets provide a mechanism for trading carbon emissions allowances, allowing companies and individuals to offset their emissions by purchasing credits. These credits can be generated through various climate mitigation activities, such as reforestation. Businesses and individuals can explore new ways to support climate adaptation initiatives and help build a more sustainable future by investing in carbon credit.

    7.3 In Lao PDR, the development of a robust carbon market offers several co-benefits benefits. First, it can generate additional revenue for the government, which can be allocated to fund climate change adaptation projects. Second, it can attract private sector investments in low-carbon projects, such as renewable energy and sustainable agriculture. Third, it can help Lao PDR meet its international climate commitments and improve its reputation as a climate-responsible country. To establish a thriving carbon market in Lao PDR, several key steps are taken. First, the government develops a clear and transparent regulatory framework that governs carbon trading activities. This framework includes rules for carbon credit issuance, verification, and trading. Second, the government invests in capacity building to ensure that relevant stakeholders, including government officials, businesses, and civil society organizations, have

the necessary knowledge and skills to participate in the carbon market. Third, the government promotes the development of carbon projects that generate high-quality carbon credits. This can be achieved through providing financial incentives, technical assistance, and enabling policy support.

7.4 Public-Private-People Partnerships are collaborative arrangements among governments, private sector entities, and civil society organizations to deliver public services. This partnership in developing resiliency requires joint assessment of the challenges and opportunities for changing the current conditions. It is carried out by identifying policy linkages among the climate change-related sectors, bringing local capacity along with the incentives for investment and sharing benefits among the communities and the private sector. The role of local governance experimenting with innovative models and capturing the best practices is crucial to moving forward with climate action.

Development of climate change adaptation roadmaps and Disaster Risk Reduction strategies

8. Addressing climate change risks and the development of adaptation road maps requires a multifaceted approach that combines technological innovation, financial support, and robust governance. By leveraging these tools, policymakers, businesses, and communities can build more resilient societies and safeguard the well-being of future generations.

8.1 Location intelligence using Geographical Information Systems (GIS), powered by Artificial intelligence (AI), offers valuable insights for climate change adaptation and disaster risk reduction. By analyzing vast amounts of data, locational intelligence is used to identify vulnerable areas, predict natural disasters, and optimize resource allocation. For instance, algorithms can analyze historical weather patterns, land use data, and demographic information to assess flood risk in coastal cities. This knowledge can inform urban planning decisions, such as building codes and evacuation routes, to enhance resilience. Additionally, AI-powered early warning systems can provide timely alerts to communities facing imminent threats, enabling proactive measures to protect lives and property.

8.2 Weather-based insurance provides a financial safety net and food security for individuals and businesses affected by climate-related disasters. In ASEAN, where extreme weather events are becoming more frequent and severe, such insurance is crucial. By developing innovative weather index products, insurance companies can offer affordable coverage for farmers, fishermen, and other vulnerable groups. For example, insurance policies can be linked to rainfall indices, allowing farmers to receive compensation if their crops are damaged due to drought or excessive rainfall. These insurance policies help mitigate economic losses and promote resilience among vulnerable communities.

8.3   The European Union's Monitoring, Reporting, and Evaluation framework plays a vital role in tracking progress toward climate-smart development. By establishing standardized reporting requirements and verification procedures, the MRV framework ensures transparency and accountability in sectoral actions. This enables member countries to assess the effectiveness of climate policies, identify areas for improvement, and allocate resources efficiently. For example, the MRV framework requires member states to report their actions on greenhouse gas emissions and resource efficiency improvements in the tourism sector. This data is used to monitor progress towards the EU's climate targets and to identify sectors where additional efforts are needed.

Recommendations for Coordinated Actions in Support of the ASEAN Climate Action Plan

9.   The ASEAN region is increasingly vulnerable to climate change, facing a range of risks and changes in agricultural productivity and water availability affecting and making economic growth vulnerable. To effectively address these challenges, a comprehensive climate action plan is essential. The peer-to-peer learning and group discussions among the participants resulted in the following key recommendations:

9.1   Enhancing the data quality of climate information, risks, and vulnerability Information.

- To establish a regional data hub to collect, analyze, and share climate-related data, including temperature, precipitation, sea level rise, and extreme weather events. This action will provide a solid foundation for evidence-based decision-making by ASEAN member states (AMS).
- To invest in quality control measures to ensure the accuracy and reliability of climate data. To collaborate with international organizations and research institutions aiming at developing standardized methodologies and protocols.
- To recognize the value of indigenous knowledge systems and integrate them into climate data collection and analysis. This action can provide valuable insights into local climate patterns and impacts.

9.2   Developing effective adaptation roadmaps in a participatory way for resilience.

- To develop adaptation roadmaps based on various climate scenarios to enhance flexibility and resilience. To consider a range of potential impacts, including sea level rise, extreme weather events, and changes in agricultural productivity.
- To identify and prioritize areas that are most vulnerable to climate change, such as coastal regions, low-lying areas, and agricultural communities. To focus on implementing adaptation measures in these regions to reduce risks and build resilience.
- To foster collaboration among government agencies, businesses, civil society organizations, and research institutions to develop and implement

adaptation strategies. To ensure that the voices of vulnerable communities are heard, and their needs are addressed.

9.3. Piloting priorities and mainstreaming climate risks in sectoral planning.

- To promote sustainable agriculture practices, such as agroforestry, climate-smart agriculture, and water conservation. To invest in research and development that aims at developing climate-resilient crop varieties and livestock breeds.
- To implement coastal management plans to protect coastal ecosystems, including mangroves and coral reefs. To promote sustainable fisheries practices and reduce pollution safeguarding marine resources.
- Infrastructure and Urban Planning: Integrate climate change considerations into urban planning and infrastructure development. To invest in climate-resilient infrastructure, such as flood control systems, seawalls, and sustainable transportation systems.
- Health and Disaster Risk Reduction: Strengthen health systems to respond to climate-related health risks, such as heat stress, waterborne diseases, and vector-borne diseases. To enhance disaster preparedness and response capabilities.

9.4 Capacity-building and Innovative Financing for climate-smart ASEAN.

- To invest in capacity-building programs to equip government officials, businesses, and communities with the skills and knowledge needed to implement climate change adaptation measures. Focus on training in climate science, risk assessment, and adaptation planning.
- To explore innovative financing options, such as green bonds, crop insurance climate funds, and carbon markets, to mobilize resources for climate change adaptation. Encourage private sector investment in climate-resilient projects.
- To strengthen cooperation among AMS to share knowledge, experiences, and best practices in adaptation to climate change. Encourage collaboration among stakeholders' countries and other developing regions.

10. By implementing these recommendations, ASEAN can enhance the region's resilience to climate change and secure a sustainable future for its people. A comprehensive and coordinated approach that addresses data and information, adaptation roadmaps, sectoral policies, and capacity-building will be essential to achieving these goals.