Webinar Series on Climate Change Projection for Disaster Risk Reduction in Asia-Pacific Region with Cambodia

Challenges and Research Initiatives on Climate Change Impact in Cambodia

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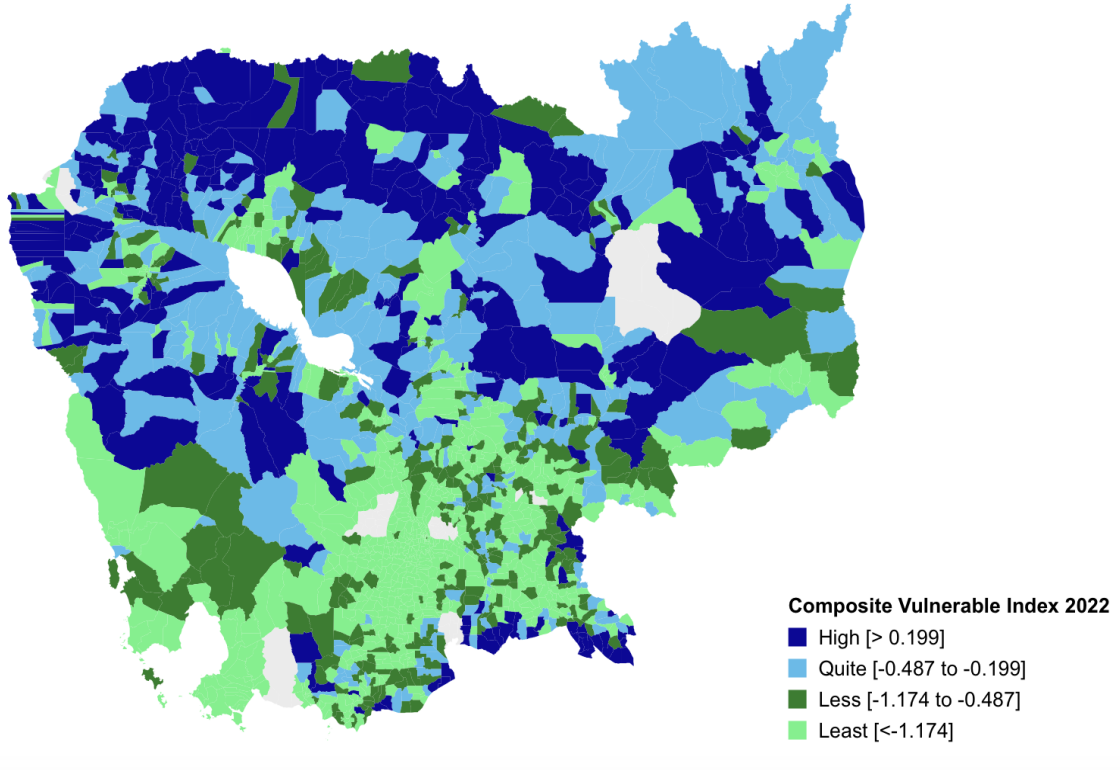
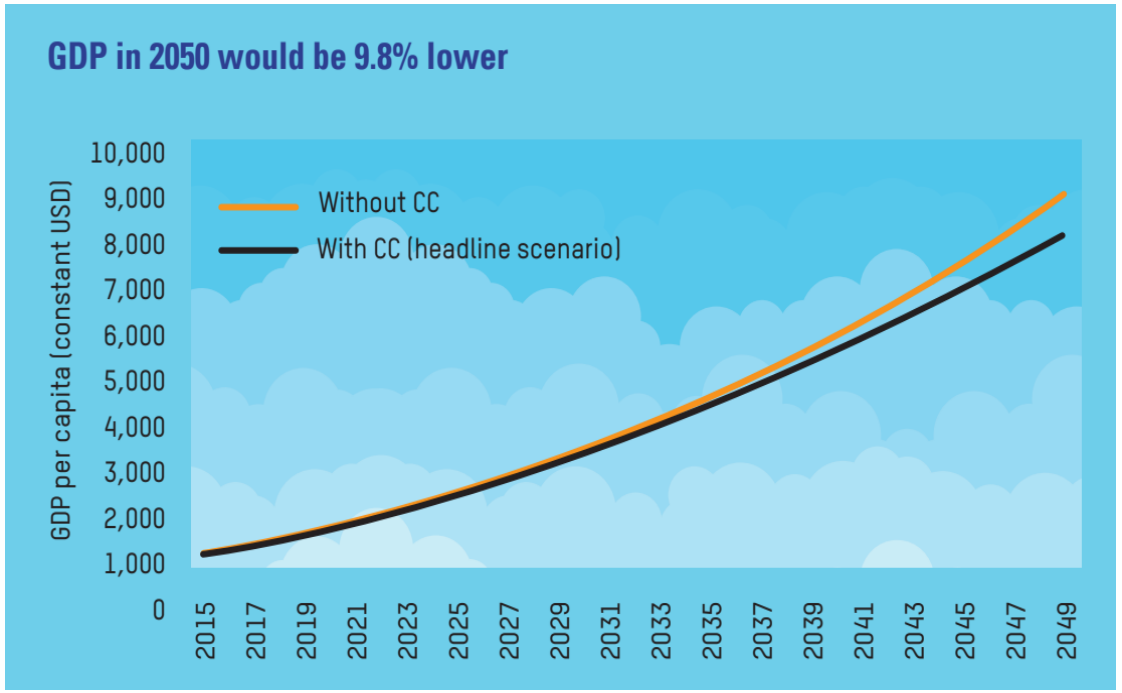
1. Climate Change Impacts in Cambodia

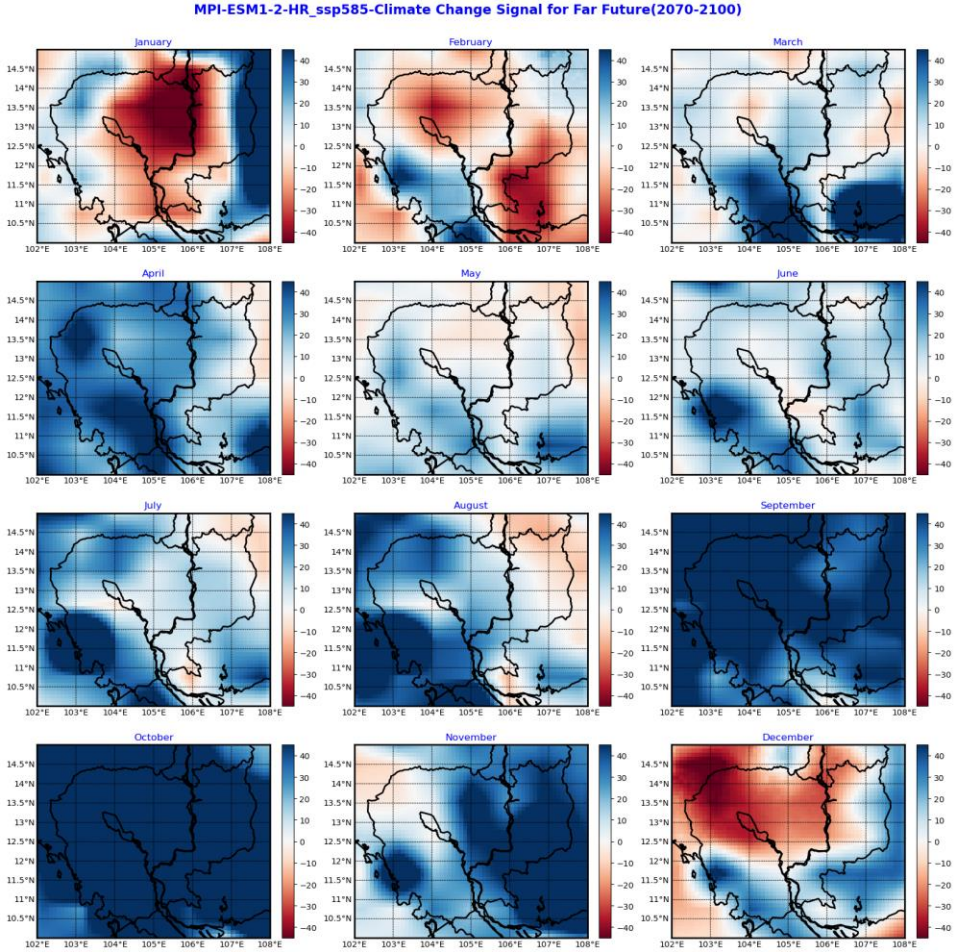
- Cambodia is among the most vulnerable countries to the impacts of climate change and exposed to climate risks (ranked 19th in the World Risk Index, 2019).
- Based on Vulnerability Index accessed by the Ministry of Environment, 44% of the total communes in Cambodia are ranked as either vulnerable or highly vulnerable to climate change (floods, droughts, and storms).
- Cambodian children were ranked 46th among the most vulnerable countries in the world to the impacts of climate change and related hazards based on the CCRI 2024.



Climate Change Impacts in Cambodia

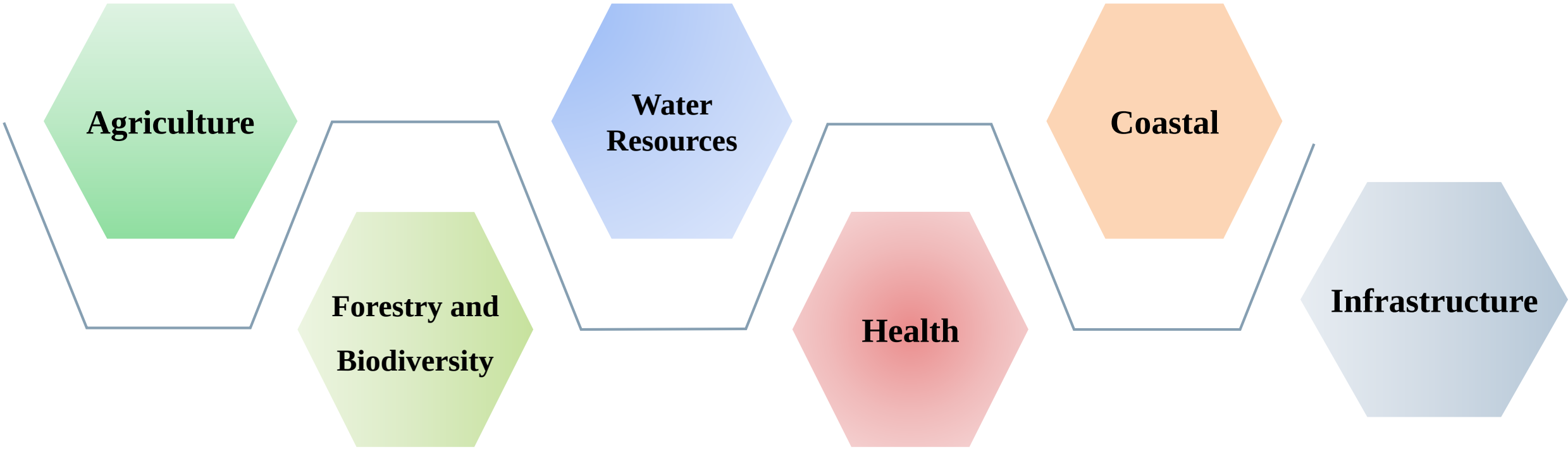


- Without additional action, Cambodia's GDP could be almost 10% lower than planned by 2050, due to climate change.
- Current study by MoE shows that if the sea level raises at 1302mm by the next 50 years, it will inundate coastal areas in Cambodia, causing a variety of land use along the coastline to affect about 242 km^2, costing about 304 million USD lost.



- Based on a recent research shows that the potential threats of more dry spell events related to drought and more heavy rainfall events in most parts of Cambodia in the next 5 decade.

Climate Change Impacts in Cambodia



Vulnerable sectors to the impact of climate change in Cambodia

2. Climate change responses in Cambodia

Mitigation actions

Adaptation actions

To reduce GHG emissions in prioritized sectors:

To improve resilience in prioritized sectors:

Agriculture

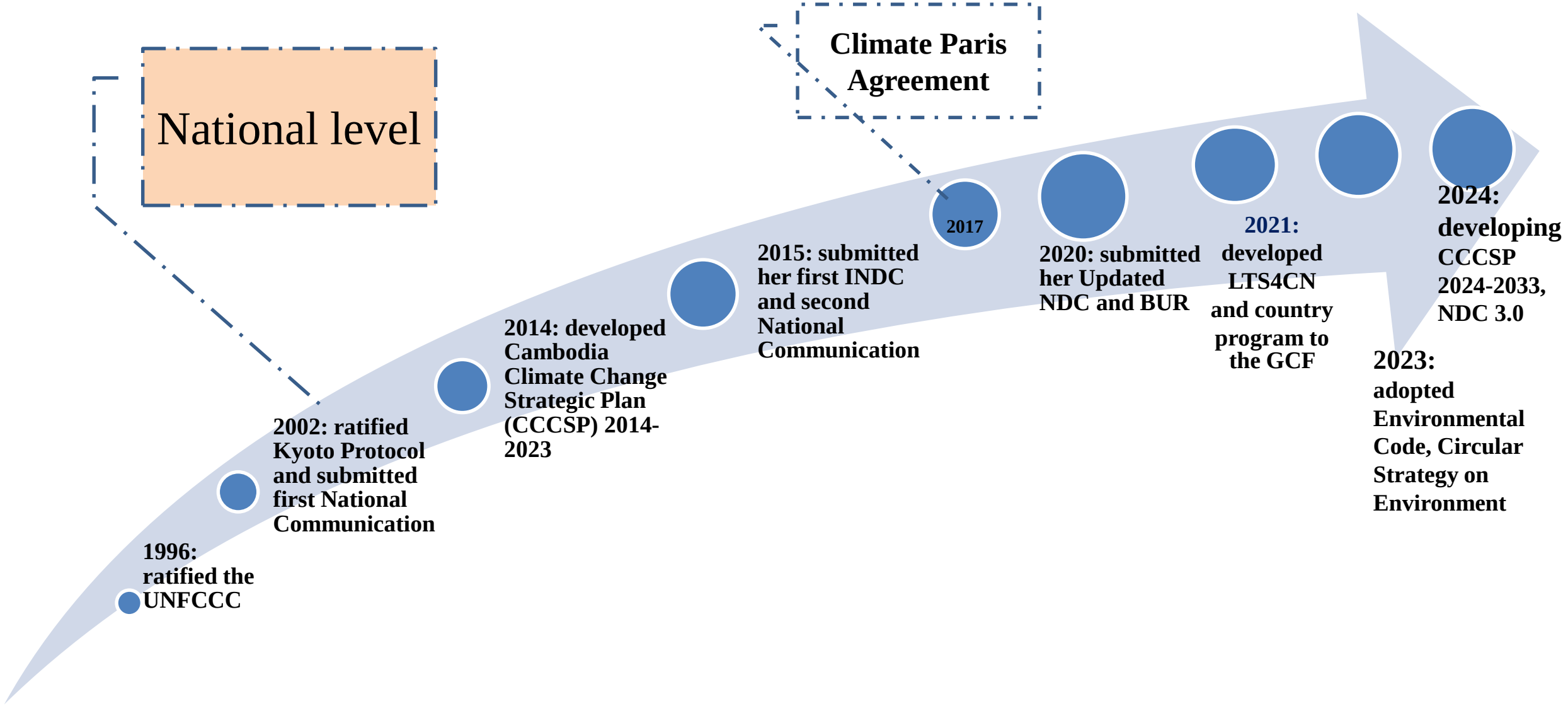
Energy

FOLU

IPPU

Waste

Policies and regulations in responding to climate change



Mitigation actions

Energy

- Renewable energy (62% of the current to total energy source) and aims to increase by 70% in 2030
- Energy Efficiency
- No new coal generation capacity beyond already committed projects

Transportation

- Public transportation
- EV initiatives (70% for motorcycles and 40% for cars and urban buses by 2050)
- Increased fuel efficiency for internal combustion engine vehicles
- Research initiatives on CBA

Forestry

- Green Cambodia's strategy, by **planting 1 million trees** yearly to achieve 60% forest cover
- Strict Law Enforcement to stop deforestation
- REDD+ Implementation, JCM and so on

Waste

- Sustainable waste management
- Anti-Plastic Campaigns (Today I don't use plastic bag, Cambodia Clean Khmer Can Do it and so on)

Adaptation to climate change

Agriculture

- Climate Smart Agriculture including no-till farming
- Organic agriculture
- Composting technology
- Research initiatives on CSA

Water resources

- Water conservation practices
- Water irrigation system
- Early Warning system in vulnerable areas and urbans

Health

- Promoting public and private partnership in health sector
- Promoting research and publications on climate change-related health

Coastal Zone

- Low impact development approaches in coastal areas
- Vulnerability mapping
- Resilient Infrastructure
- Research and innovation

3. Research Initiates in Cambodia

Study on the impact of heat stress on human productivity (garment, education, and construction sectors) and economy in Cambodia

Overall objective: Prevent economic loss for policy planning and increase human resources in heat stress in Cambodia

Location: Phnom Penh
Partners: ITC, NUS, PolyU, MoEYS,

Results:

- Evidence on the impact of heat stress on construction, education, and garment sectors
- Solution to make cooler workplace and energy efficiency adaptation
- Heat stress base includes measurement tools and devices, methodology, data input template
- Economic loss due to heat stress

All sectors: **11.2%** annual decrease in industrial productive working time **USD 2,638 million** economy-wide output loss in 2018.

By **2035** further **USD 634 million** output loss is estimated

Affecting the agriculture **16.7%**, construction **9.8%**, manufacturing **3.5%**, and services **3.2%**

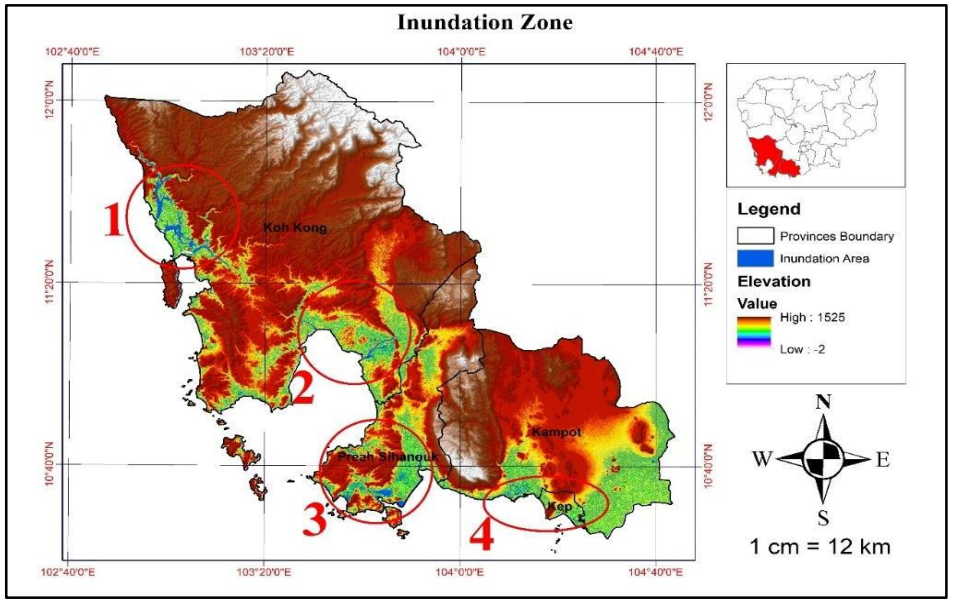
Improving Capacity on Integrated Coastal Management with Low Impact Development Considering Environmental Sustainability and CLID

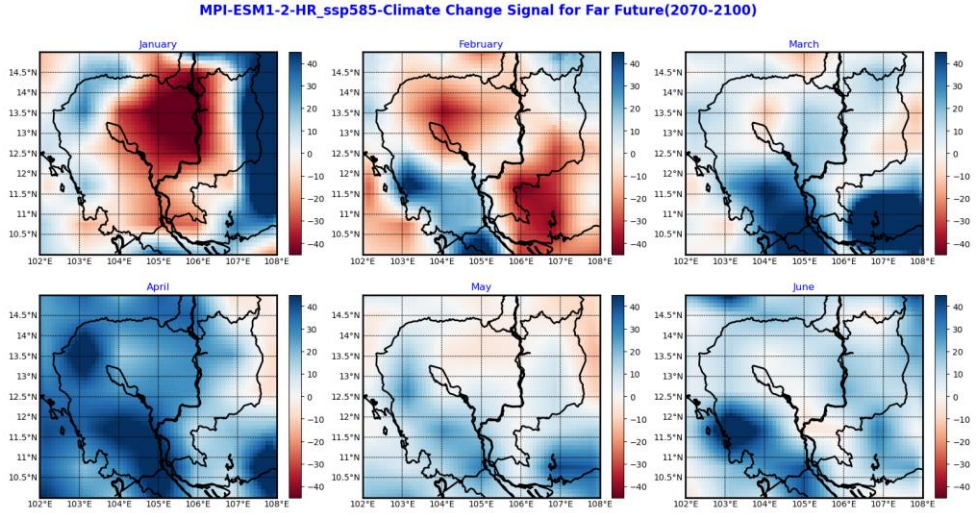
Overall objective: support the integration of best practices in LID with urban planning process through scenario evaluation platforms.

Location: 4 Coastal Provinces
Partners: ITC, and Kyoto University and RUA

Results:

- Baseline and endline study of LID in the areas
- Sea-level rise inundation map for coastal area
- Report on Climate Change Status and future projection in Cambodia and capacity building





Investing into Soil Organic Carbon Management for Resilient and Low Emissions Upland Farming (ISOC)

Overall objective: assess the impacts of conservation agriculture on soil organic C and for annual upland cropping systems

Location: Upland area
Partners: NUBB, RUA, and Nagoya University

Results:

- Land use change and the conversion of forest to agricultural lands (annual and perennial crops) have a negative impact on soil organic carbon stock with a depletion that ranged from 31% to 69% (depletion rate of -3.4 to -5.9 MgC/ha/y)
- The transition from conventional plough-based to conservation agriculture-based management emphasized that some soil parameters were already sensitive to management practices.

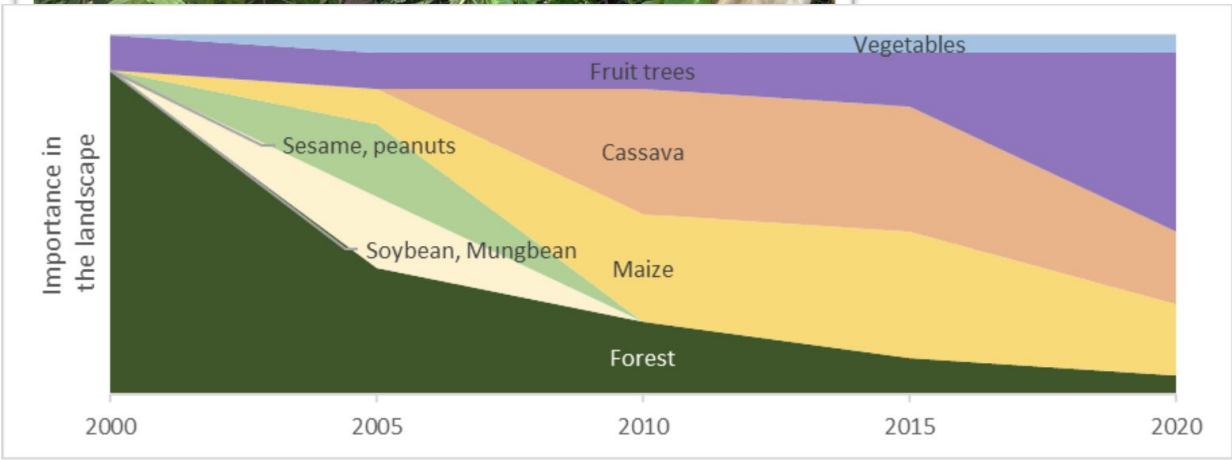


Figure 2: Main trends regarding the LULC changes in the previous 20 years in the study area

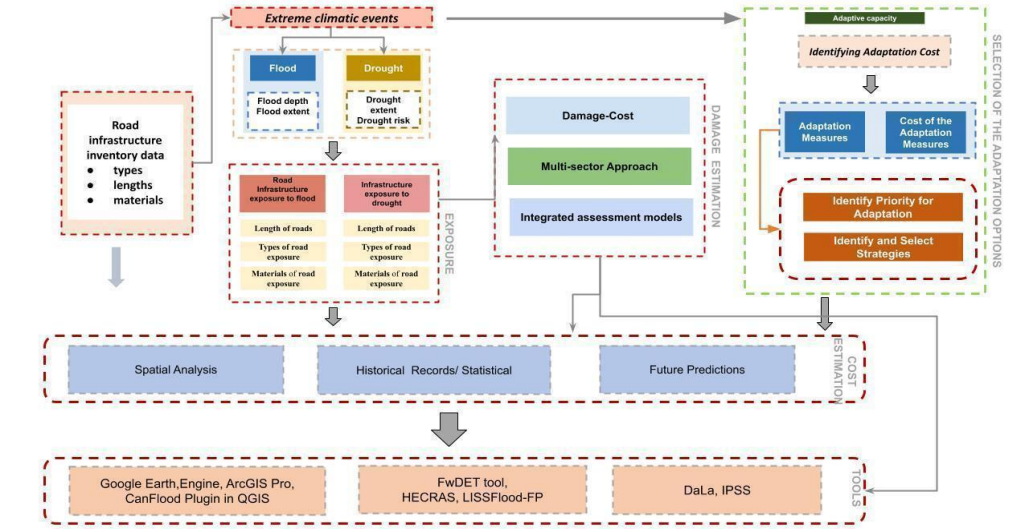
Appropriate costing methods of climate change adaptation in infrastructure development: experimental studies for road and related infrastructure projects in Cambodia (CAMI)

Overall objective: Enhance the climate resilience capacity of roads and related development sectors in Cambodia

Location: selected provinces
Partners: Royal University of Phnom Penh, AIT, University of Freiburg, and CCCA3

Results:

- Development of methods and tools for assessing losses and damages
- Development of methods and tools for assessing adaptation costing (CBA)
- Guidelines on analysis of losses and damages, and adaptation costing methods developed.



Framework of Loss and Damage assessment for Road and related Infrastructure in Cambodia

Other CC and DRR Projects Implementation at the Ground Level

Project tile 'Strengthening Climate Information and Early Warning System in Cambodia to Support Climate Change Resilient Development and Adaptation to Climate Change'

Overall objective: Address the flood mitigation challenge and reduce the vulnerability of urban populations to climate change impacts

Location: Battambang City
Partners: NCDM, PIN, CCCA3, and local authorities

Other CC and DRR Projects Implementation at the Ground Level

Upgrading the climate investment information database of sub-national government of Cambodia

Overall objective: 1)- Sub-national database has climate investment data and the report on climate investment data could be extracted;
2)- data transfer between NCDDS and NCSD is effective;
3)- VRA data at pilot sites are available in NCSD data portal and new data collection system approach is proposed)

Location: Selected provinces
Partners: NCDD and CCCA3

4. Challenges

- Lack of data availability and quality: lack of historical climate data may be sparse or inconsistent, complicating efforts to analyze trends and make accurate projections
- Limited tool and technologies used in the climate change research
- Limited technical expertise: shortage of trained professionals and researchers with expertise in climate science and related fields, especially climate change modeling
- Limited funding and resources
- Lack of a clear policy and coordination institutions in climate research and dissemination
- Lack of in-depth understanding of adaptation and mitigation measure and its related interdisciplinary.

Forwards

- Resource mobilization for climate change research
- Enhance collaboration and coordination among key stakeholders
- Continue promoting human resources in climate change research through small grants and other applicable windows
- Disseminate results and findings with key stakeholders and acquire lessons learned from advance countries and others
- Leverage related research policies on climate change and incentives towards private sector evolvement

Thank you for your attention!