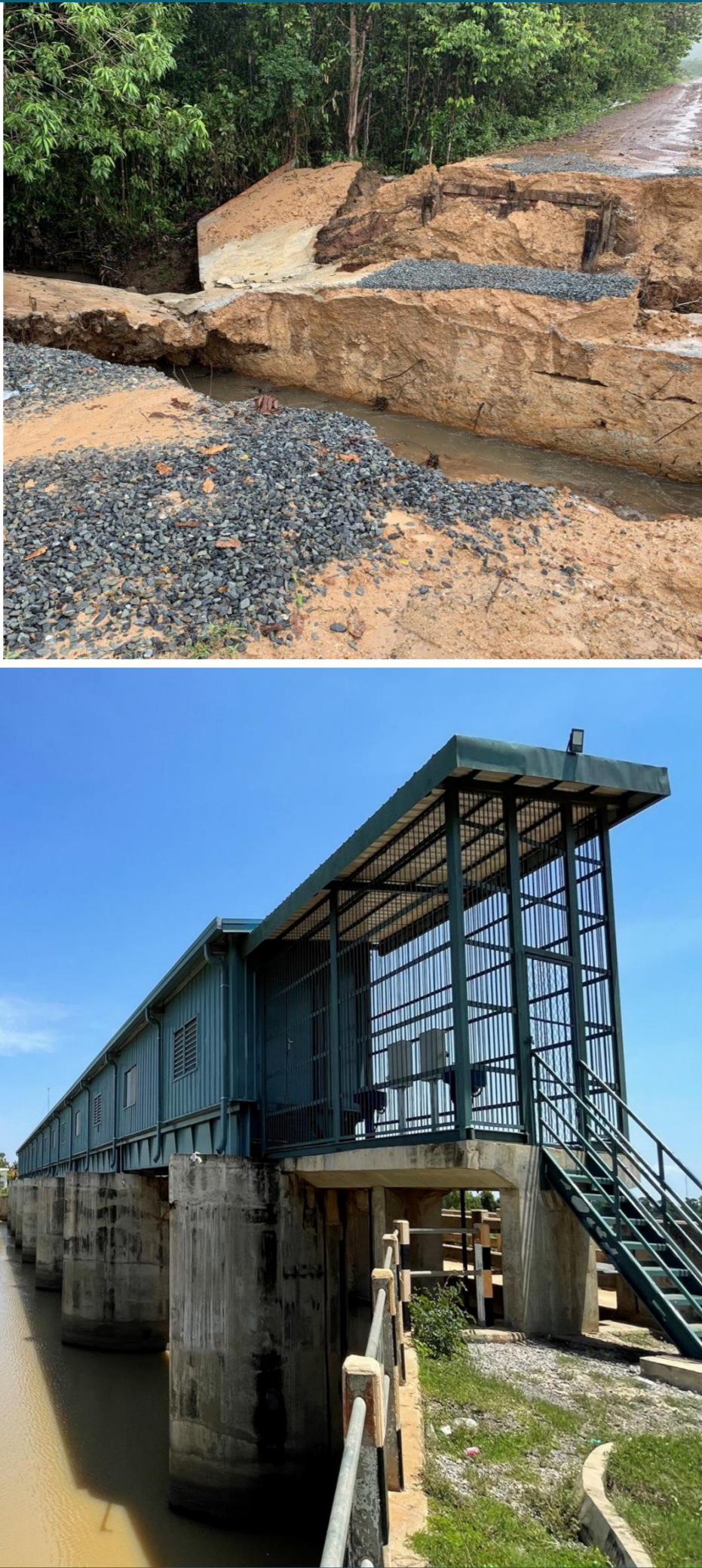


Appropriate Costing Options of Climate Change Adaptation in Infrastructure Development: Experimental Studies for Road and related Infrastructure Projects in Cambodia (CAMI)

Project Implementor: Master of Science in Climate Change Program, Graduate School of Science, Royal University of Phnom Penh (MCC/RUPP)
Project Partners: Asian Institute of Technology, Thailand; University of Freiburg, Germany (Foreign); Ministry of Public Work and Transport (MPWT), Ministry of Rural Development (MRD) (Local)
Project Locations: Kampong Thom and Pursat (Tonle Sap Lake), Kratie and Prey Veng (Mekong River), and Kampot (coastal zone)

Background

The road network in Cambodia extends over a total length of more than 61,000 km; of which 16,292 km categorized as national and provincial roads are managed and developed by Ministry of Public Work and Transport (MPWT); and 45,242 km as rural roads are under mandate of Ministry of Rural Development (MRD). Because of climate change impacts coupling with poor design and lack of climate resilient planning consideration, these road networks and irrigation systems have been severely damaged every year, and many sections of roads and canals are cut off during the heavy rainfalls. In 2019 alone, flood caused damage to about 500 km long, directly affected 488,611 households, and damaged agricultural crops of some 36,724 ha. The national budget used for repair and maintenance of roads and related infrastructures has reportedly increased every year from 36 mil USD in 2010 to 90 mil USD in 2017. Therefore, the appropriate costing for climate adaptation of roads and related infrastructure projects needs to be comprehensively studied so that damages and losses caused by flood and other climate hazards can be properly incorporated from the economic and climate change standpoints. Until recently, we are implementing the fourth quarter of the project, and the fifth is going to end by this June 2022.



Outputs and key activities

1. Damages and losses due to climate change on roads and related infrastructures conducted (national and rural roads, bridges, culverts, small scale irrigation system, and related infrastructures) analyzed.
2. Cost and benefit analysis on roads and related infrastructures utilized (for two scenarios without and with climate change adaptation measures, including climate projections).
3. Practical tools and methods for MPWT and MRD officers for analyzing adaptation related financial costs in roads, small scale irrigation, and related infrastructures developed.



Objectives

The project goal is to enhance the climate resilience capacity of roads and related development sectors in Cambodia.

Impact: contribute toward building climate resilient transport and small-scale irrigation infrastructures in Cambodia by adopting the cost effectiveness methods of adaptation, and improving the national climate resilient capacity in order to save the national budget and optimize the economic growth.

Key project outcome: analyses of damages and losses and adaptation costing due to impacts of climate change incorporated into development planning of roads and related infrastructure programs in Cambodia.



Implementation progress

1. Carry out desk review of tools and methods used to assess damages and losses from climate change for road and related infrastructure projects in Cambodia and region.
2. Desk review of tools and methods applied for identifying the adaption cost of concerned infrastructure projects adaption projects in Cambodia and region.
3. Acquire historical data on climate change induced damages and losses of roads and related infrastructure assets of MPWT, MRD, and relevant sources
4. Conducted capacity need assessment on estimating damages and losses of roads and related infrastructures from Climate Change impacts, and their adaptation costing.



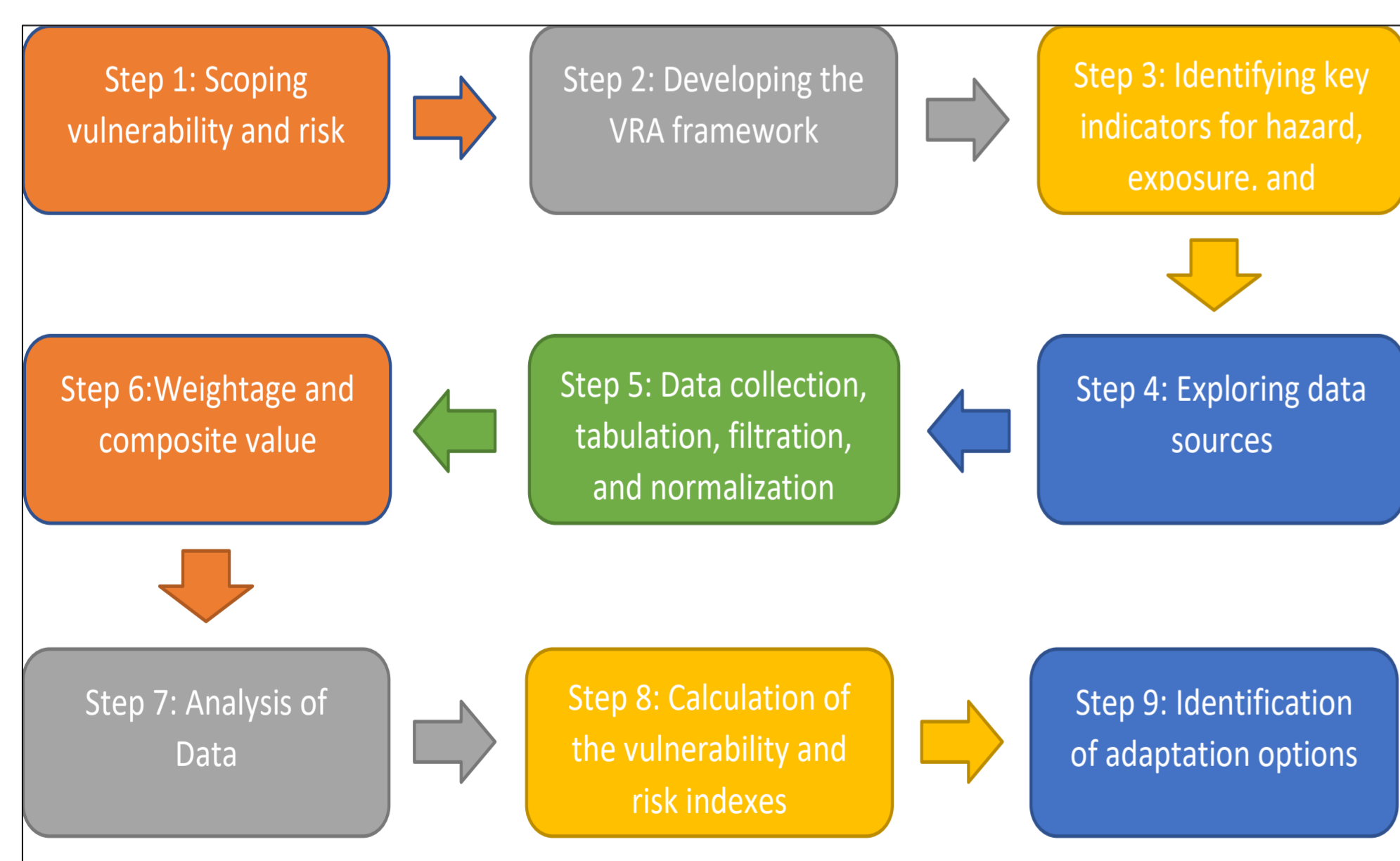
Key technologies and approaches introduced

The project approach will investigate the appropriate adaptation costing for infrastructure aspects through experimental studies on cost benefit analysis, and damages and losses.

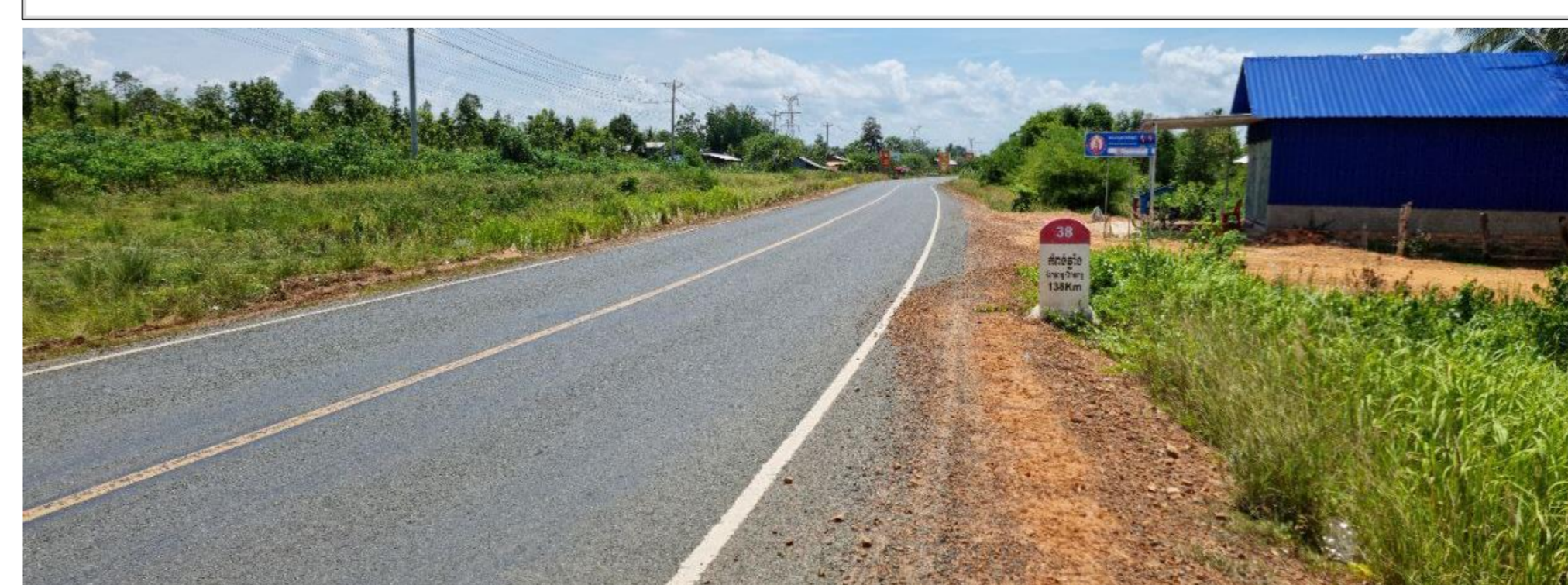
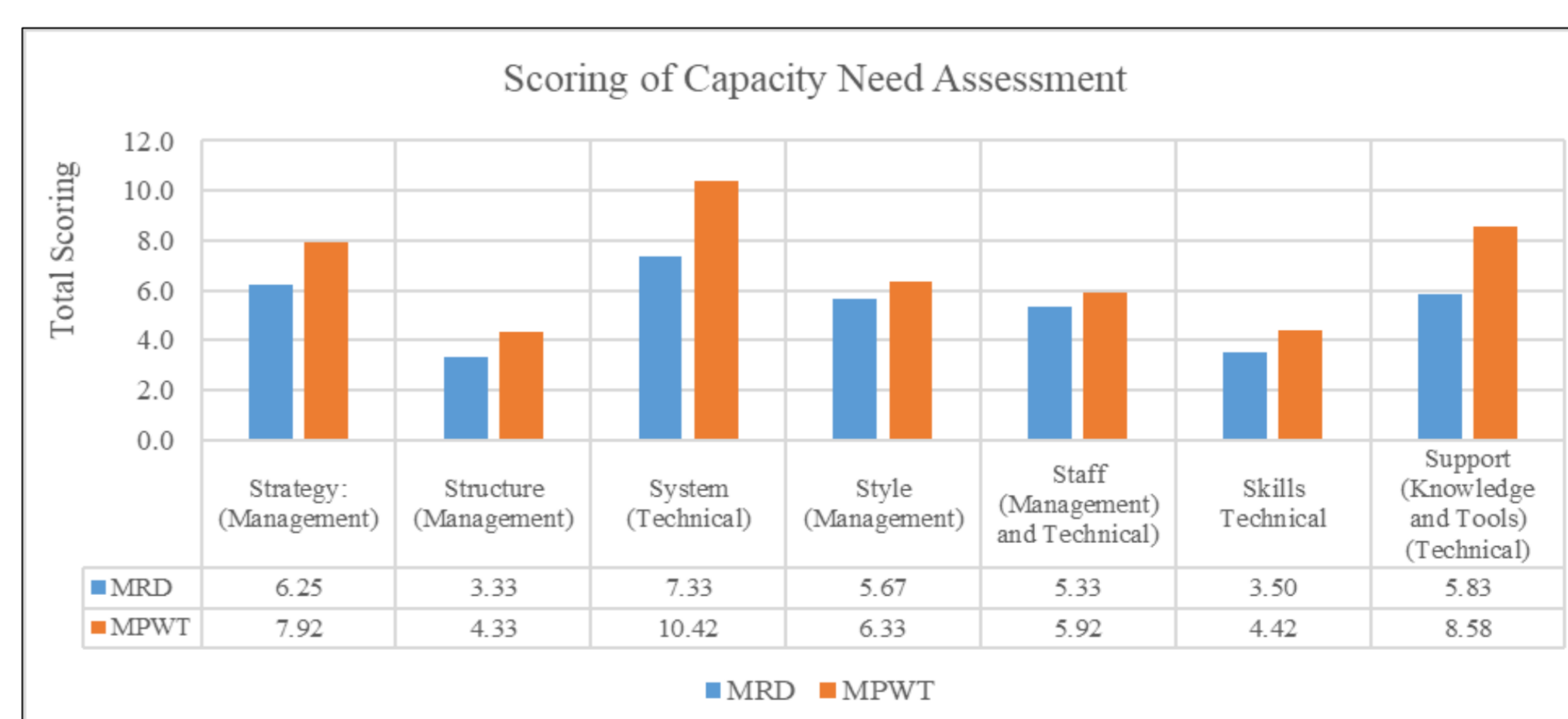
- **Approaches to estimate Loss and Damage**
 1. Historical data
 2. Projected data
 3. Aspects: Maintenance and performance of Development projects
- **Adaptation Strategies**
 1. Design parameters
 2. Choice of materials
 3. Maintenance
 4. Life-cycle costing
- **Cost Benefit Analysis**
 1. Adaptation Strategies with climate change scenario
 2. Adaptation Strategies without climate change scenario

Key challenges and lessons learnt

- Due to COVID-19 pandemic from previous quarters, field survey by AIT partner to finalize the tools and methods for loss and damage assessment was delayed to second quarter of 2022 (June).
- Technical constraints to financial procurement.
- Opportunity to expand academic cooperation with foreign partners and joint activities with local partners on the other aspects.
- The project team has learnt a lot about the variety of tools and methods used for loss and damage assessment, and adaptation costing of climate change projects in the region. Based on these available tools we could identify and develop the tailored methods for Cambodia's climate change projects.



Approaches to Assess Vulnerability - Vulnerability and Risk Assessment (VRA) Framework: Nine Steps based on the Infrastructure Resilience to Flooding.



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CAMBODIA CLIMATE CHANGE ALLIANCE

