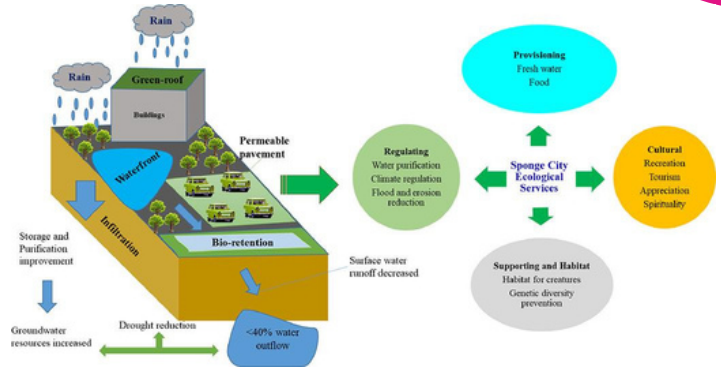


RESEARCH

Research on Improving Capacity on Integrated Coastal Management with Low Impact Development Considering Environmental Sustainability and Climate Change in Coastal Area of Cambodia (CLID)

The integration of climate change mitigation and adaptation strategies into urban planning is essential for ensuring the long-term sustainability of rapidly growing coastal cities. Low Impact Development (LID), commonly referred to as the Sponge City Concept (SCC), employs nature-based solutions to manage stormwater by promoting infiltration, evapotranspiration, and the reuse of excess water. The LID practice integrates watershed management strategy by providing natural retention, treatment, and source protection capabilities. This innovative approach not only enhances urban water management but also strengthens cities' resilience to the increasing impacts of climate change.



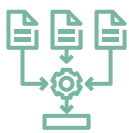
LID or Sponge City Concept

OBJECTIVES

- Urban stormwater modelling and scenario analysis for LID
- Sea-level rise analysis and its impact on coastal areas
- Climate change data processing and impact analysis
- Baseline studies and impact surveys
- Capacity building

RESEARCH METHODOLOGY

Target area: The coastal provinces of Koh Kong, Sihanoukville, Kampot, and Kep



Utilize scientific modelling tools and dataset for scenario analysis on land use changes, urban floods, global warming, and climate change impacts such as PCSWMM, (ECMWF) ERA5 database, and Policy Decision making for Future climate change (d4PDF)



Propose scenarios combining land-use changes and climate change impacts to apply LID or SCC in the study areas



Estimate sea-level rise for the Cambodian coastline using climate models and developing sea-level rise inundation maps



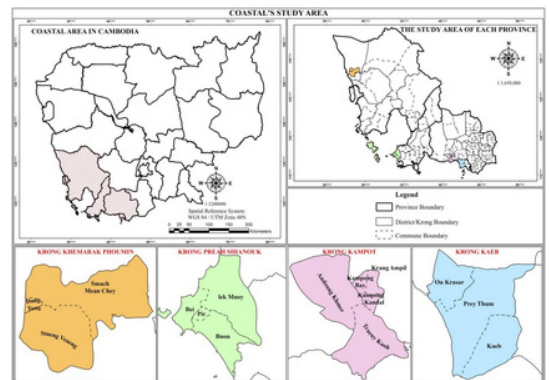
Perform baseline and end-line surveys among practitioners, planners, decision-makers, and local communities to assess the project's impact and raise awareness of LID



Conduct dissemination activities and training workshops to engage stakeholders



Publish scientific articles and support research of undergraduate and graduate students on LID



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RESEARCH RESULTS



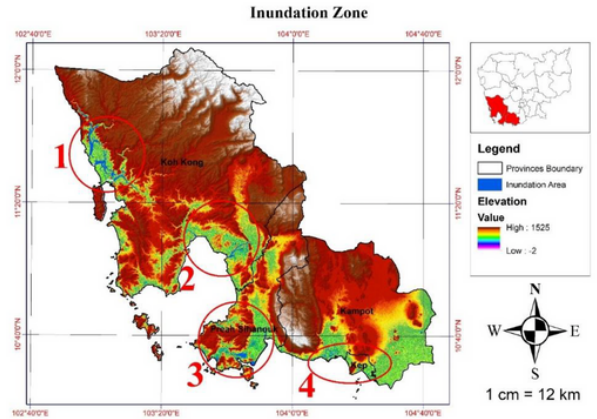
Urban flood simulations indicate that applying the LID concept reduces flood depth and duration in sub-catchment areas.



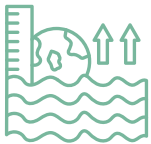
Cambodia is experiencing rising temperatures and is projected to face increasing droughts and floods in the coming decades due to global warming.



Sea level rise analysis shows an annual increase of 5.96 mm, with projections of up to 1302 mm over the next 50 years. This will inundate 242 km² of land, leading to an estimated economic loss of 304 million USD, affecting areas like Khemarak Phoumin City, Botum Sakor district, Preah Sihanouk coastline, and Kampot City.



Inundation zone in the coastal area of Cambodia



Sea level rise will worsen coastal groundwater quality, shifting the seawater interface inland from 97 meters to 514 meters over the next 50 years.



The LID baseline survey reveals limited understanding of LID concepts among households and stakeholders in coastal areas, though most recognize the severe impacts of climate change and are concerned about sea level rise.



The d4PDF projects that if global temperatures increase by 2°C, surface temperatures in Cambodia will rise by 1°C to 2.5°C, and by 3°C to 4.5°C if global temperatures increase by 4°C.



A scientific paper was published in an international journal, and four Master's and six Bachelor's students graduated.



Three training workshops were conducted for 80 stakeholders (including 15 females) from provincial administration, departments, academia, local communities, development partners, NGOs, and the private sector.

13 CLIMATE ACTION



RECOMMENDATION

- Develop a compendium of coastal biodiversity hotspots, a master plan for affected areas, and awareness programs for sustainable resource management, targeting coastal communities and local authorities.
- Design a new drainage system in urbanizing areas to mitigate flooding.
- Increase public and private investment in adaptation strategies to address flood and drought impacts on health, infrastructure, the economy, environment, wildlife, agriculture, and water resources.
- Advocate for the national government to incorporate the LID concept into public investment plans and collaborate with sub-national authorities, private sectors, and international agencies to improve construction methods and legal frameworks.
- Organize practical training to enhance technical skills related to LID concepts.
- Integrate LID practices into education curricula and research programs.
- Pilot small-scale LID initiatives in coastal regions, involving relevant stakeholders and local authorities.

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