



UN-HABITAT ADAPTATION FUND

Climate Change Adaptation through Small-Scale
and Protective Infrastructure Interventions in
Coastal Settlements of Cambodia (CCA4CS)

Water Infrastructure Rehabilitation for Climate Resilience in Kep Province

Improving Water Access, Reducing Flood Risk, and Supporting Sustainable Agriculture



MAY 2025
PHNOM PENH, CAMBODIA

BRIEF SUMMARY

Under Outputs 3.2a and 3.2b of Component 3, the project rehabilitated one damaged water gate and one 1,706-meter canal section with a storage capacity of 6,403 cubic meters in Kep Province. These efforts aimed to strengthen local resilience to climate extremes by improving irrigation and reducing flood risks. In total, the intervention was designed to benefit 19,553 people.

KEY ACHIEVEMENTS

1. Strategic Realignment of Scope

In response to procurement challenges in September 2024, NCSD revised the original plan to repair three water gates, focusing instead on one severely damaged gate. This decision followed stakeholder consultations and was formally endorsed by the Project Management Committee on 16 September 2024.

2. Contracting and Implementation

A Letter of Agreement was signed on 2 December 2024 to formalize the revised intervention. Following a competitive bidding process, Seng Chanrithy Construction Company was contracted, and construction was completed between January and late March 2025.

3. Monitoring and Compliance

The NCSD Adaptation Officer conducted routine site visits to ensure construction progress and technical quality. Environmental and Social Safeguards (ESS) protocols were strictly followed throughout the implementation phase.

4. Official Handover and Public Engagement

A formal handover ceremony was held on 8 April 2025 with 103 participants, including high-level government officials and community representatives. The event marked the successful completion of the intervention and reinforced community ownership and visibility.

5. Visibility and Accountability

Project signboards displaying the logos of NCSD, MoE, UN-Habitat, and the Adaptation Fund were installed at the intervention sites. These signboards enhanced transparency, donor recognition, and public awareness of the project's achievements.

GOOD PRACTICES

1. Strong Local Engagement and Landowner Collaboration:

Kep Provincial Hall played a vital role in securing agreements from landowners along the canal, ensuring smooth implementation. This community buy-in was essential for delivering irrigation and flood management benefits to surrounding villages.

2. Proactive Field Monitoring and Technical Supervision:

Weekly inspections and continuous dialogue with the contractor ensured quality assurance. NCSD provided real-time technical advice, including ESS compliance, such as fencing the water gate to mitigate operator risk.

3. Participatory and Priority-Based Decision-Making:

The team conducted a pre-inspection of the project areas and updated priorities based on the severity of dam

age and funding constraints. This adaptive, consultative approach allowed resources to be focused where they were needed most.

4. In-Kind Community Contributions for Safety:

Local community members agreed to install fences across bridges as an in-kind contribution, enhancing safety and ownership while reducing project costs.

5. Empowered Sub-National Authorities:

Provincial and Sangkat-level leaders were given full responsibility for oversight and implementation. Their active participation in field visits and coordination activities demonstrated strong local ownership and commitment.

LESSONS LEARNED

1. Vegetation Growth Requires Long-Term Monitoring:

While the project promoted nature-based erosion control, vegetation takes time to establish. Continuous monitoring and follow-up over six to twelve months post-handover are needed to ensure effective embankment stabilisation. Where feasible, riprap or concrete may be used in areas prone to rapid erosion.

2. Water Infrastructure Yields Multiple Benefits:

Rehabilitated canal and gate directly improved climate resilience, agricultural productivity, and local livelihoods. Strategic investment in such infrastructure should be prioritised in future adaptation programming.

RECOMMENDATIONS

1. Promote Participatory Tree and Grass Planting:

Subnational authorities should engage communities in re-greening embankments. This will support erosion control while strengthening local stewardship and project sustainability.

2. Establish Local O&M Mechanisms:

To maintain functionality, Sangkat leaders should mobilise local patrol groups for regular sediment removal, waste cleanup, and vegetation control. Training on solid waste management and small-scale maintenance is recommended.

3. Manage Household Wastewater Connection to Canals:

Encourage households, particularly those near canals, to install waste filter nets on outlet pipes to prevent solid waste from entering water bodies.

4. Institutionalise Periodic Desilting:

The large sediment volume removed during this project signals the need for recurring maintenance. A long-term plan with dedicated funding and community involvement—ideally with biannual desilting—is essential for sustaining water flow and flood protection.

PROJECT OVERVIEW

Since August 2021, the United Nations Human Settlements Programme (UN-Habitat) and the National Council for Sustainable Development (NCSD) have been implementing the "Climate Change Adaptation through Protective Small-Scale Infrastructure Interventions in Coastal Settlements of Cambodia" Project (CCA4CS), with financial support from the Adaptation Fund.

The project aims to strengthen climate resilience and adaptation in Cambodia's most vulnerable coastal settlements, in Kep Province and Prey Nob District of Preah Sihanouk Province, through targeted interventions around three interconnected components:

Component 1: Community-scale knowledge and capacity enhanced to sustain the adaptation benefits of the project's investments.

Component 2: Government planning and technical capacity enhanced and knowledge captured and disseminated to sustain and enhance the project's adaptation benefits.

Component 3: Resilience built through investment in small-scale protective and basic service infrastructure and natural assets.

These initiatives will enhance communities' capacity to withstand climate-related challenges by focusing on areas where ecotourism can support long-term sustainability. Through these components, the project addresses immediate climate risks and lays the foundation for long-term sustainability and resilience in Cambodia's coastal communities.

RATIONALE FOR THE INTERVENTION

During the project formulation phase, the assessment team identified that communities in Kep Province were unable to properly manage and distribute water to agricultural fields or ensure an adequate water supply for domestic use. This challenge has been exacerbated by declining rainfall and prolonged droughts—climate change-driven phenomena that increasingly threaten water security. The area's irrigation system had become ineffective, especially during the dry season, placing rice farmers and households at risk of chronic water shortages.

On the other hand, the wet season brought its problems. The canal downstream of the Roness Reservoir was found to be heavily silted and choked with overgrown vegetation, significantly reducing its discharge capacity, and heightening the risk of flooding. In both extremes—drought and flood—poor water management and dilapidated infrastructure were causing significant impacts on livelihoods, food security, and local economies. Therefore, there was an urgent need to rehabilitate the canal and repair critical water gate infrastructure to enhance climate resilience and secure water for agriculture and domestic use.

BRIEF DESCRIPTION OF THE INTERVENTION

The project focused on repairing one severely damaged water gate and rehabilitating 1,706 meters of canal in the total length of infrastructure to address vulnerabilities associated with extreme weather events, including intensified rainfall and prolonged drought. This work was implemented under Outputs 3.2a and 3.2b. The project was expected to benefit approximately 19,553 people by reducing flood risks during the rainy season and ensuring water availability for farming and household use during dry months. The long-term objectives were twofold: first, to enhance resilience to climate-induced natural hazards by safeguarding livelihoods, infrastructure, and lives; and second, to secure sufficient water supply for rice production and domestic consumption during dry periods. This report summarises the experiences from implementing these activities in Kep Province, highlighting key achievements, good practices, lessons learned, and recommendations for replication and scale-up.



KEY ACHIEVEMENTS

1. Reassessment and Realignment of Project Scope

The project implementation was initiated with a bidding process in September 2024. However, no bids met the financial and technical criteria aligned with the project's available budget. Consequently, the NCSD held a consultation with Kep authorities to reconfirm intervention sites. During this discussion, stakeholders noted that two of the three water gates that were initially planned had already been repaired using funds from the Provincial Department of Water Resources and Meteorology (PDoWRAM). Due to budget constraints and evolving needs, it was agreed that one severely damaged water gate and a 1,706-meter canal with a 6,403 m³ capacity would be prioritised for intervention.

2. Formal Approval and Construction Execution

This change in scope was formally endorsed by the Project Management Committee (PMC) on 16 September 2024. Later, in November 2024, the NCSD finalised terms with provincial stakeholders and signed a Letter of Agreement (LoA) for the revised works. A public bidding process was launched and awarded to Seng Chanrithy Construction Company. Construction commenced in early January 2025 and was completed by late March 2025. The NCSD, especially its Adaptation Officer, conducted regular site inspections and monitoring visits throughout the construction period, including a pre-inspection phase.

3. Completion, Handover, and Community Engagement

The formal handover took place on 8 April 2025, presided over by His Excellency Pheav Sovuthy, Under Secretary of State of the Ministry of Environment and Chair of the PMC. The event was also attended by Mrs. Tit Sokha, Deputy Governor of Kep Province, as well as representatives from NCSD/MoE, UN-Habitat, the construction firm, local authorities, and 103 community members—36 per cent of whom were women.

4. Key Milestones

By March 2025, the project successfully rehabilitated one water gate and 1,706 meters of canal, fully adhering to engineering standards and environmental safeguards. This infrastructure intervention benefited 19,553 people by ensuring sufficient irrigation during dry seasons and protecting against floods during rainy periods.

The project also demonstrated strong stakeholder engagement through effective coordination between NCSD, local authorities, and landowners—facilitating smooth implementation, including land contributions and site-level collaboration. To build local capacity, subnational authorities were empowered to manage the implementation process, supported by regular site visits and progress reporting mechanisms that promoted transparency and adaptive supervision. Furthermore, the project strictly followed the Environmental and Social Management Plan (ESMP), incorporating safety fencing and ensuring cleanliness across all construction sites.



4. Monitoring, Compliance and Visibility

The NCSD Adaptation Officer conducted routine site visits to ensure construction progress and technical quality. Environmental and Social Safeguards (ESS) protocols were strictly followed throughout the implementation phase. Project signboards bearing the logos of NCSD, MoE, UN-Habitat, and the Adaptation Fund were installed at the completed sites for public visibility.

GOOD PRACTICES

1. Effective Stakeholder Engagement and Landowner Cooperation

One of the project's standout achievements was the effective engagement of local stakeholders and landowners. The Kep Provincial Hall took the initiative to communicate with landowners along the canal route and successfully secured their agreement to support the construction works. This cooperation benefited residents and farmers in Ou Krasar and Damnak Chambak, creating a replicable model for future infrastructure interventions.

2. Strong Monitoring and Quality Control Mechanisms

Another good practice was establishing a strong monitoring framework, which included weekly updates, detailed field inspections, and photographic records. The NCSD team worked closely with commune leaders to monitor progress, environmental and social safeguard compliance, and technical quality. For instance, when a safety concern was identified at the water gate, the project team promptly requested the installation of a protective fence.

3. Adaptive and Evidence-Based Decision-Making

The decision-making process also reflected strong alignment with field realities. The original target of three water gate repairs was revised following pre-inspections, revealing that two had already been repaired through other government resources. This led to prioritising the remaining severely damaged gate and the most urgent canal section. This adaptive, participatory approach ensured that limited project resources were focused on the most impactful needs.

4. Community Contributions and Subnational Ownership

Community contributions played a vital role as well. During a field visit, local stakeholders noticed that a bridge crossing the rehabilitated canal lacked protective fencing. In response, they mobilised materials and labour through in-kind contributions to enhance safety, demonstrating high levels of ownership and commitment. Additionally, subnational authorities were given full responsibility for overseeing on-the-ground implementation. Their active engagement—including accompanying project teams on monitoring visits—contributed significantly to the project's success.

LESSONS LEARNED

1. Timing Constraints for Vegetation Establishment

While the project achieved its core objectives, several important lessons emerged. One was the challenge of timing for vegetation establishment. As the Environmental and Social Safeguards (ESS) consultant recommended in December 2024, tree and grass planting were encouraged for soil erosion prevention. However, vegetation requires growing time, and the project timeline did not allow for sufficient follow-up. It is therefore recommended that stakeholders continue monitoring these efforts for at least 6–12 months after the handover. In cases of persistent erosion, engineering solutions such as riprap or concrete embankments may be necessary.

2. Value of Strategic Water Infrastructure for Climate Resilience

Another key lesson is the value of investing in strategic water infrastructure. The rehabilitation works reduced flood and drought risks and contributed to stronger agricultural productivity and livelihood security for local farmers. This underscores the importance of data-driven, community-centred, targeted infrastructure investments and aligns with long-term climate resilience goals.

RECOMMENDATIONS

1. Promote Participatory Erosion Control with Local Communities

A participatory approach to erosion control is strongly recommended to ensure long-term sustainability. Commune and Sangkat authorities should engage residents in tree and grass planting along embankments to strengthen climate resilience and community ownership.

2. Establish Sustainable Local Maintenance Mechanisms

Second, establishing local mechanisms for sustainable operation and maintenance (O&M) is critical. While the project has restored the canal and water gate functionality, future sustainability depends on routine maintenance. Commune leaders should mobilise local patrol groups to clear sediment, organic waste, and overgrown vegetation. Capacity-building on solid waste management and small-scale maintenance should also be supported at the sub-national level.

3. Encourage Household-Level Pollution Prevention

Third, Sangkat authorities should encourage nearby households to install waste filter nets at the outlets of wastewater pipes to minimise pollution and blockages in the canal.

4. Develop a Long-Term Desilting Plan with Community Involvement

Finally, the project revealed a recurring need for desilting. The large quantity of sediment removed during construction points to the importance of ongoing maintenance. It is therefore recommended that Kep provincial and Sangkat authorities develop a long-term desilting plan with dedicated resources and community involvement. Regular desilting—annually or biannually, depending on sediment accumulation—will be essential to protect this investment and ensure water flows safely and efficiently through the rehabilitated infrastructure.

DOCUMENTATION

Name	Type	Produced Date	Location
Technical design (Output 3.2a)	Design	November 2024	Link
Technical design (Output 3.2b)	Design	November 2024	Link
Pre-Construction Site Inspection Report	Report	March 2025	Link
Regular Monitoring Reports	Report	April 2025	Link
Post-Construction Site Inspection Report	Report	April 2025	Link

PHOTOS





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