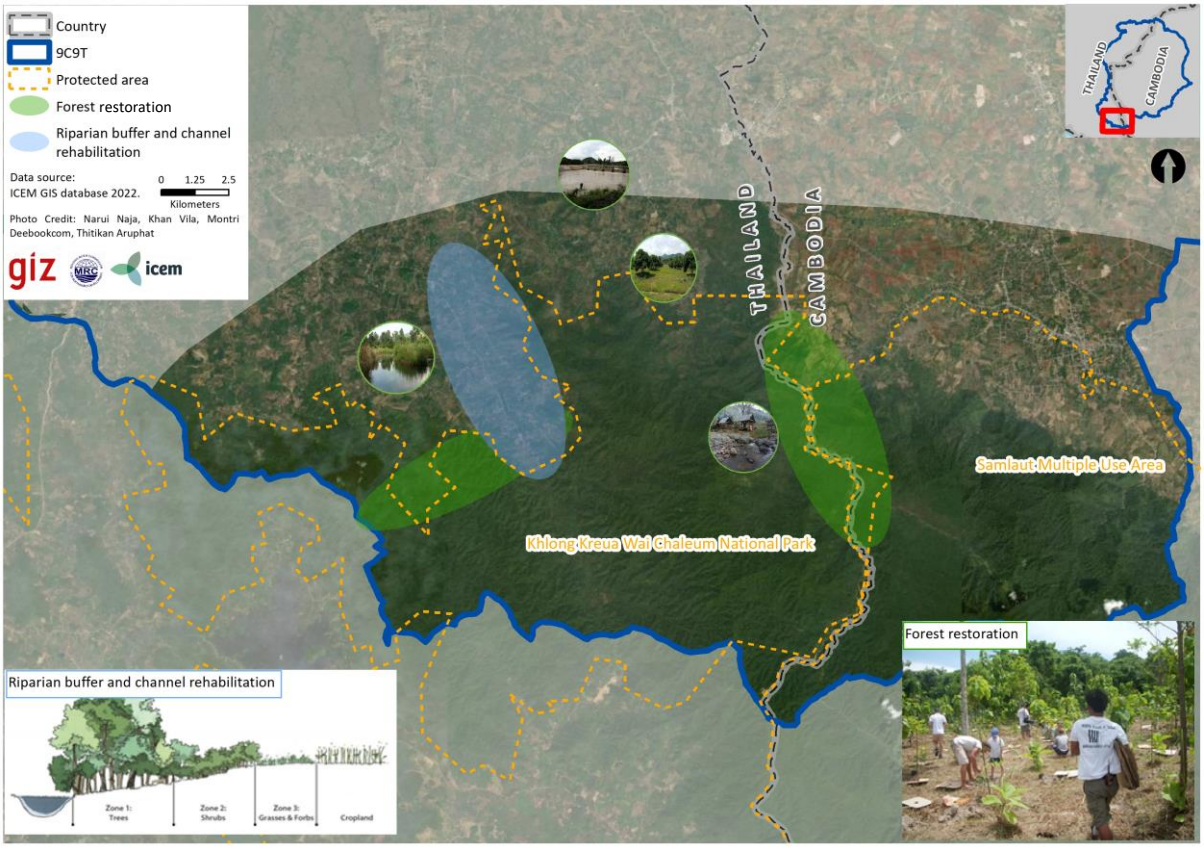
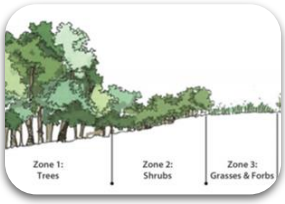
PROJECT 1: TRANSBOUNDARY HEADWATERS AND PROTECTED AREAS – SAMLAUT MULTIPLE USE AREA (CAMBODIA) AND KHLONG KREUA WAI CHALEUM NATIONAL PARK (THAILAND)

1. Project Overview





1. Riparian buffer

6. Forest restoration and rehabilitation

Project 1 is a key landscape area for the demonstration of nature based and hybrid solution networks, with selection factors including protected area encroachment and watershed and forest degradation with downstream water security and quality impacts. The project objectives for this landscape include:

- Establishment of measures to foster watershed rehabilitation, forest restoration and protected area and buffer zone ecological restoration; and
- Work together with the lead and supporting agencies, as well as local and provincial stakeholders to ensure an integrated and transboundary approach to watershed rehabilitation and forest restoration is implemented within the both the Multiple Use Area (MUA) and National Park (NP), that aligns with the 9C-9T Masterplan and Action Plan.

Table 1: Project 1 – Master Plan implementation factors

Item	Description
Alignment to 9C-9T Masterplan	• **Focal Area 2**: Manage urban and rural flood and drought to reduce risk • **Outcome 2.3**: Rehabilitated basin headwaters and wetlands, to improve water security and climate resilience through ecosystem-based adaptation interventions • **Output 2.3.1**: Develop and implement at least six (3 in each country) interventions for rehabilitation and effective management of protected areas and upper watersheds in river basin headwaters – to improve and maintain the delivery of ecosystem services, with an emphasis on safeguarding transboundary biodiversity of international importance
Implementing stakeholders	• **Lead agency (Cambodia)**: Ministry of Environment (MoE) • **Lead agency (Thailand)**: Department of National Park, Wildlife and Plant Conservation (DNP) • ***Supporting agency (Cambodia)***: Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Water Resources and Meteorology (MOWRAM) and provincial government • ***Supporting agency (Thailand)***: Office of the National Water Resources (ONWR), the Ministry of Agriculture and Cooperatives, the Ministry of Natural Resources and Environment (MoNRE) and provincial government
Alignment to agency priorities	DNP, an agency of the Ministry of Natural Resources and Environment in Thailand, has a mission towards the conservation, protection, restoration and sustainable management of forest resources and wildlife. Khlong Kreua Wai Chaleum is one of the national parks under its remit Ministry of Environment is a government ministry of Cambodia with a focus on environmental protection

2. Site description

Project 1 comprises Samlaut MUA (Cambodia) and buffer zone to Khlong Kreua Wai Chaleum National Park (Thailand); a transboundary protected area landscape located on the border of Cambodia (Pailin) and Thailand (Chanthaburi). Samlaut MUA, decreed in 1993, covers an area of 60,000 Ha. Khlong Kruewai Chalearm Phrakiat National Park is a fragmented protected area, covering an area of 26,500 Ha.

The headwaters of this transboundary landscape comprise maximum elevations of over 900 m above sea level (asl). The northern extent of the MUA and national park catchments naturally drain down from the steeper, elevated areas and level off into an agricultural plain, with scattered villages and the Krong Pailin urban settlement on the Cambodian side of the border. Several discrete elevated vegetated areas are also present within the plain on the Thai side.

Samlaut comprises the northernmost range of the Cardamom Mountains and is one of Cambodia's key watersheds, as well as being the last remaining tropical rainforest in north-western Cambodia. It is an essential drainage corridor, with its rivers and streams supplying fresh water and ecosystem services for around one million people in the downstream provinces of Pailin and Battambang. Samlaut's Stung Sangker River provides for local upland crop irrigation, as well as fish stocks and water for the Tonle Sap Lake and its lowland agricultural lands.

The MUA is also an essential ecosystem for biodiversity, providing a critical habitat for endangered species of flora and fauna, whilst providing an international wildlife corridor to support ecological connectivity within the region.

2.1. Flood and drought drivers and impacts

2.1.1. Drivers

Protected area encroachment and lack of enforcement capacity

Geospatial analysis of the landscape area demonstrates significant land cover change and vegetation disturbance over the last 30 years, particularly within the northern extent of Samlaut MUA. Samlaut MUA status permits local communities the right to utilize natural resources in a sustainable manner. Despite this, precious gem/mineral mining, illegal logging, animal poaching and land encroachment continue to threaten the area. A lack of financial support and enforcement has compounded these issues over the years. Agricultural encroachment of the protected area foothills is apparent and several roads dissect the forested areas.

On the border of the 9C-9T sub-basin to the south, the buffer zone between Khao Soi Dao and Khlong Kreua Wai Chaleum National Park is significantly fragmented by linear infrastructure and urbanisation. This division inhibits a connecting wildlife corridor between the two protected areas. In 2020, an agreement was signed between the Cambodia and Thai protected area agencies to collaborate in conserving the international wildlife corridor but has not led to effective action.

Drainage structure, irrigation and reservoirs

The landscape area is an important watershed for the 9C-9T basin and has historically supported several drainage channels in the foothills and terraces below the MUA and NP. Their gradual degradation and replacement with agricultural land has resulted in reduced water storage capacity, increased drought risk and sedimentation.

2.1.2. Impacts

Forest fragmentation and biodiversity loss

Encroachment into the protected areas has led to widespread forest fragmentation and deforestation. This resulted in habitat degradation and impacts to the flora and fauna located within the MUA and national park. In addition, the development of road infrastructure and encroachment has impacted on ecological connectivity with the landscape.

Increased runoff, loss of water storage and degrade drainage channels

Encroachment into the foothills of the MUA and national park, as well as soil erosion, has impacted natural drainage channels, reducing the vegetative cover and natural water storage and supply potential of the landscape. Filling and reducing the depth of streams increases the risk of flash flooding and landslides during periods of high rainfall and high discharge. The degradation of the watershed reduces availability of water during droughts and results in an increase in sedimentation and reduced water quality – and overall loss of soils and soil condition.

2.2. Nature based and hybrid solutions project concept

2.2.1. Concept design of NbS

Measure 6: Forest restoration and Measure 1: riparian buffer strips

Forest restoration in the landscape is critical to ensure the recovery of degraded and fragmented areas and should be planned at the landscape scale, with the objective of re-establishing ecological integrity and transboundary connectivity. Several potential locations have been identified for restoration particularly in areas where there is encroachment into the MUA and national park along its northern boundary (Figure 1). Land ownership and tenure arrangements of these areas has not yet been determined through detailed field visits and site investigation. Opportunities for restoration and connected networks of drainage buffers will be explored during future investigations with national and local authorities. Measures in each location would share the same restoration objectives, as identified in Measure 6 and Measure 1 (Annex 1).

Figure 1: Forest fragmentation and degradation within the landscape area – (a) degradation along international boundary and (b) encroachment into Samlaut MUA

2.2.2. Project benefits

- Restoration of 50 ha of forest areas;
- Restored ecological connectivity between previously fragmented landscapes;
- Increased habitat provision and biodiversity value;
- Improved natural water storage and reduced sediment runoff; and
- Restoration of drainage channels and water retention for agricultural activities.