

Economic Feasibility of Enhanced Rock Weathering Carbon Credits Deployment in Southeast Asia through Mixed-Methods Analysis

YIWEN ZHANG¹, ANNA LENA SALFER^{1,2} AND SIMON REDFERN¹

¹Nanyang Technological University

²Technical University of Munich

Enhanced Rock Weathering (ERW) is gaining recognition as a scalable carbon dioxide removal (CDR) strategy with significant potential, particularly in tropical regions such as Southeast Asia (SEA). Despite its growing prominence globally, ERW deployment in SEA remains limited, with critical uncertainties surrounding market development, economic feasibility, and regulatory readiness.

This study employs a **convergent mixed-methods approach**, integrating a systematic literature review with stakeholder engagement through expert interviews and surveys. Semi-structured interview questions were designed to explore two key dimensions: (1) the development of carbon markets in SEA, and (2) the economic feasibility of ERW carbon credit projects. Interviews with technical stakeholders also incorporated geochemical considerations of weathering processes to better identify both opportunities and challenges in ERW implementation.

Qualitative and quantitative data were analysed using qualitative data analysis (QDA) software, allowing for an integrated assessment of stakeholder perspectives. The findings reveal critical barriers — including regulatory uncertainty, carbon market integration, and supply chain logistics — while also highlighting enabling factors such as SEA's high weathering potential (carbon removal potential), extensive agricultural land availability, and increasing regional interest in nature-based climate solutions.

By synthesizing insights from both academic research and practitioner expertise, this study provides a holistic evaluation of ERW's role in SEA's carbon markets. The results underscore the importance of aligning ERW deployment with regional governance structures and carbon credit frameworks to enhance its long-term viability as a CDR strategy.