



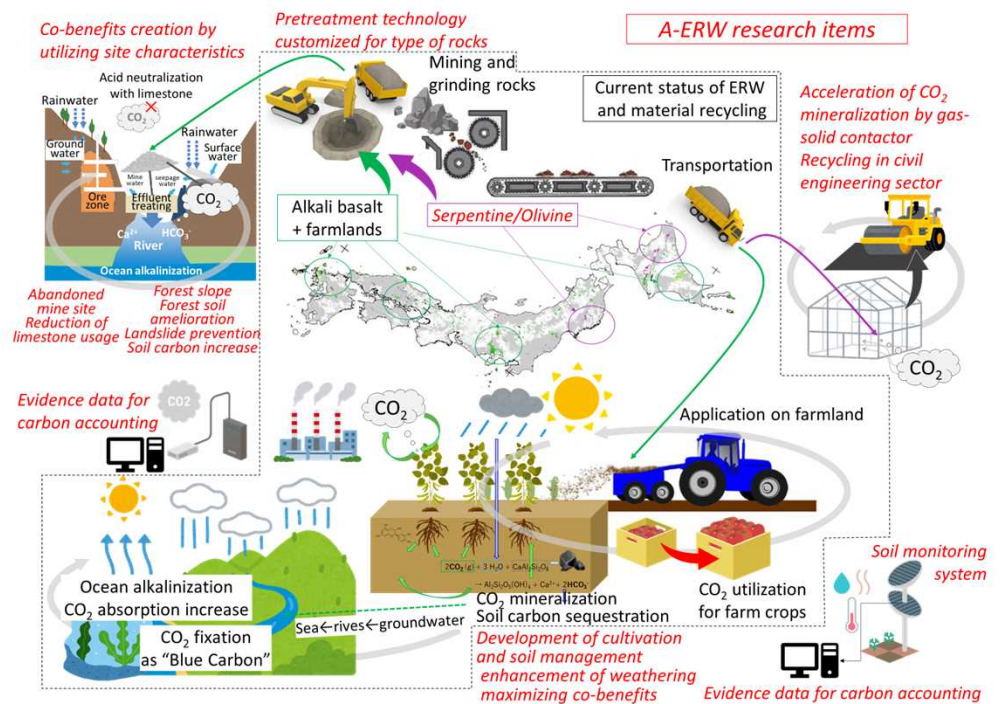
Advanced Enhanced Rock Weathering (A-ERW) Technology Actively Combined With Site Characteristics

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Summary

The combination of natural rocks utilizing the geological characteristics of Japan and the site characteristics of the weathering will further accelerate weathering and CO₂ mineralization compared to conventional techniques, as well as provide an information database of accurate carbon accounting. Among basic mafic rocks, basalt and other rocks applicable to farmland are mineralized in the soil with CO₂, resulting in co-benefits such as increased crop yields and improved soil physical properties through nutrient supply. Application on abandoned mines and forest slopes reduces CO₂ emissions by lime used as a neutralizer, and prevent landslides in forest slopes, resulting in an increase in carbon fixation. The dissolved Ca/Mg contributes to the alkalization of seas through rivers.

Other rocks with high CO₂ mineralization potential, such as peridotite, mineralize CO₂ by a simple gas-solid contactor. The information database of carbon accounting with a sophisticated natural carbon cycle model will be developed, with the aim of establishing a globally accepted international standard.



KPI

FY2024

Mineral analysis, crushing, and mineralization tests for each 4 samples at 8 sites in Hokkaido, Japan; a CO₂ mineralization potential map, selection for 3 promising candidate sites, and conceptual design and rough estimation of a large-scale demonstration test facility.

Clarification of the conditions for achieving 0.2 t-CO₂/t-Rock after one year (4 times faster than conventional methods, gas-solid contactor).

For application to farmland, exploration of conditions and co-benefits to maximize CO₂ fixation for three species, and estimation of the amount of rock weathering for multiple soil types considering mass transfer. Development of the information database for carbon accounting and upgrading the TRL for ERW technology from the current 4 to 6 (DACCS equivalent).

Implementation

Waseda University, Hokkaido University, Kyoto Prefectural University, Mitsubishi Heavy Industries, Ltd.

