

From Data to Action:
Utilizing Earth Observations Data for
Effective Carbon Credit Development

Sami Izutsu
Carbon Solution Business Unit,
Sumitomo Corporation

21/11/2024

Disclaimer

This material is for information purposes only and it should not be regarded as an offer to sell or as a solicitation of an offer to buy some products mentioned in it and/or to participate in any trading strategy.

This material is confidential and intended solely for the person attending COP29 in Baku in 2024.

The content is the speaker's personal opinion and in no case represents Sumitomo Corporation's house views.

No part of this document may be shown, copied, transmitted, published or distributed in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the express written consent of the speaker.

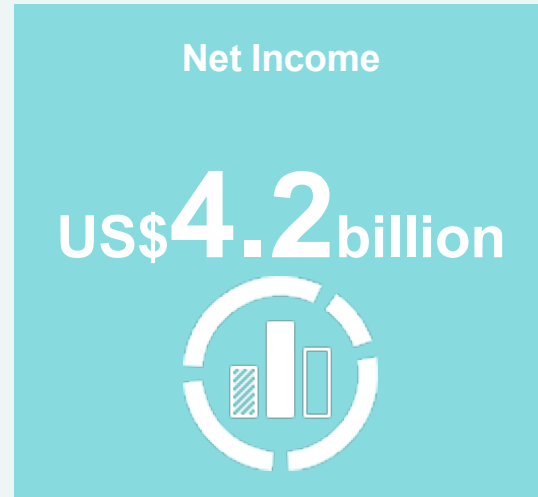
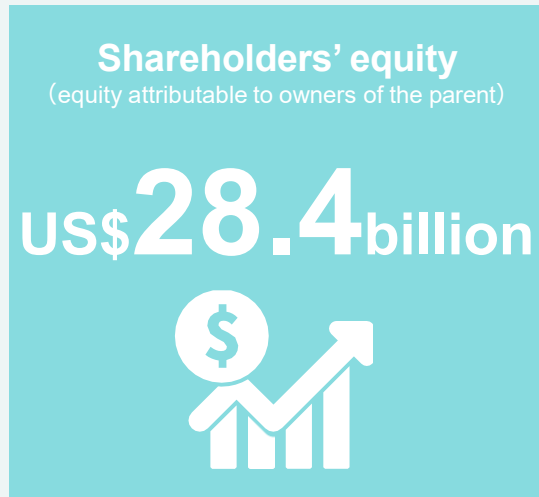
The information contained herein is subject to change without notice.

Sumitomo Corporation at a Glance

128 locations

66 Countries and Regions

as of March 31, 2023



Consolidated Subsidiaries 636 (Japan:135 Overseas:501)
Associated Companies 250 (Japan:50 Overseas:200)



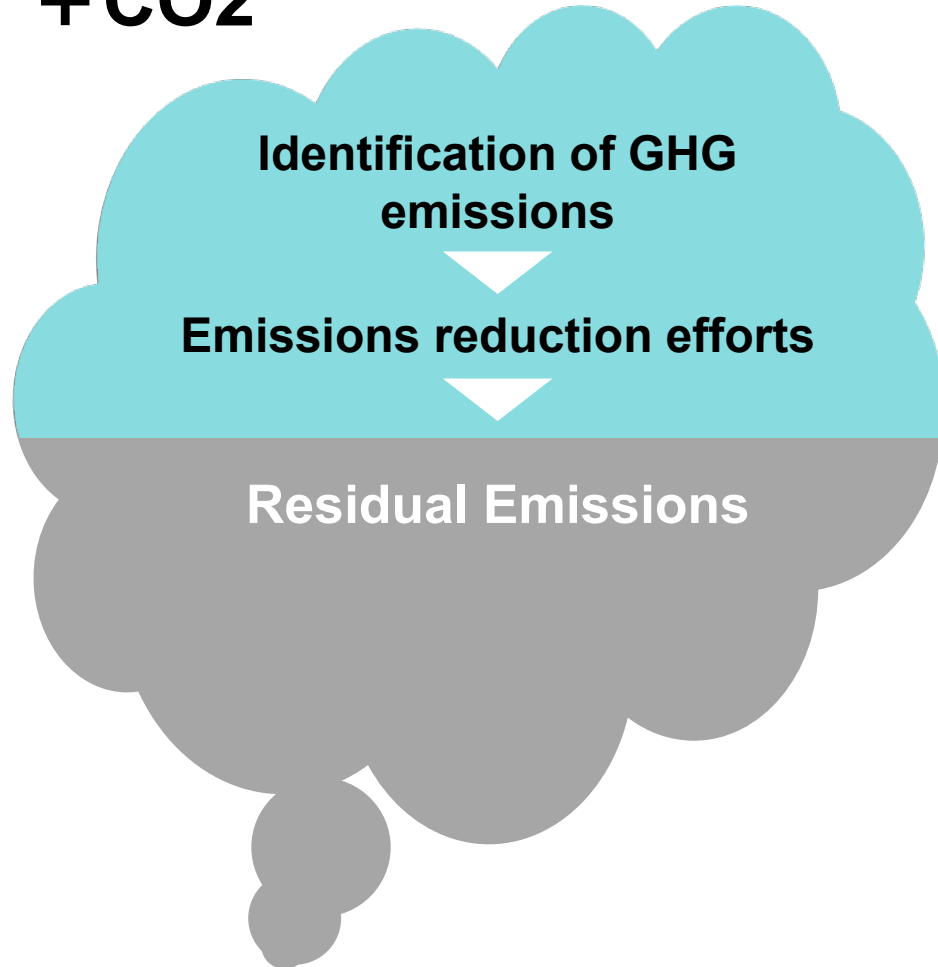
Corporate Evaluation | **Fortune Global 500**

Sumitomo Corporation has been ranked in the Fortune Global 500, an annual list compiled and published by US Fortune magazine, for 28 years, as one of the global companies leading the world's development.

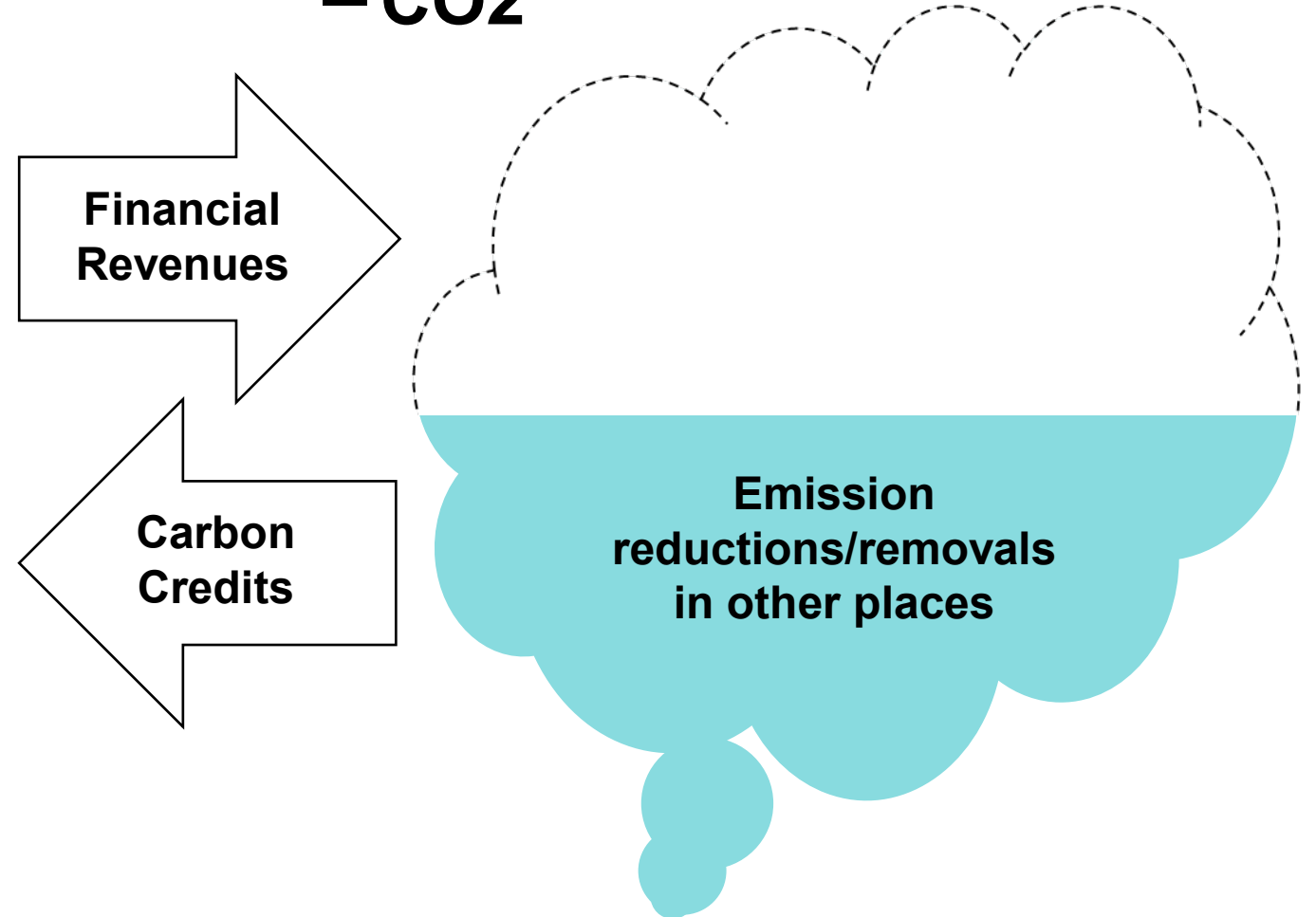
International Financial Reporting Standards (IFRS)
The US Dollar amounts represent translations of Japanese Yen amounts at the rate of ¥133=US\$1.

Carbon Market Scheme

+ CO2

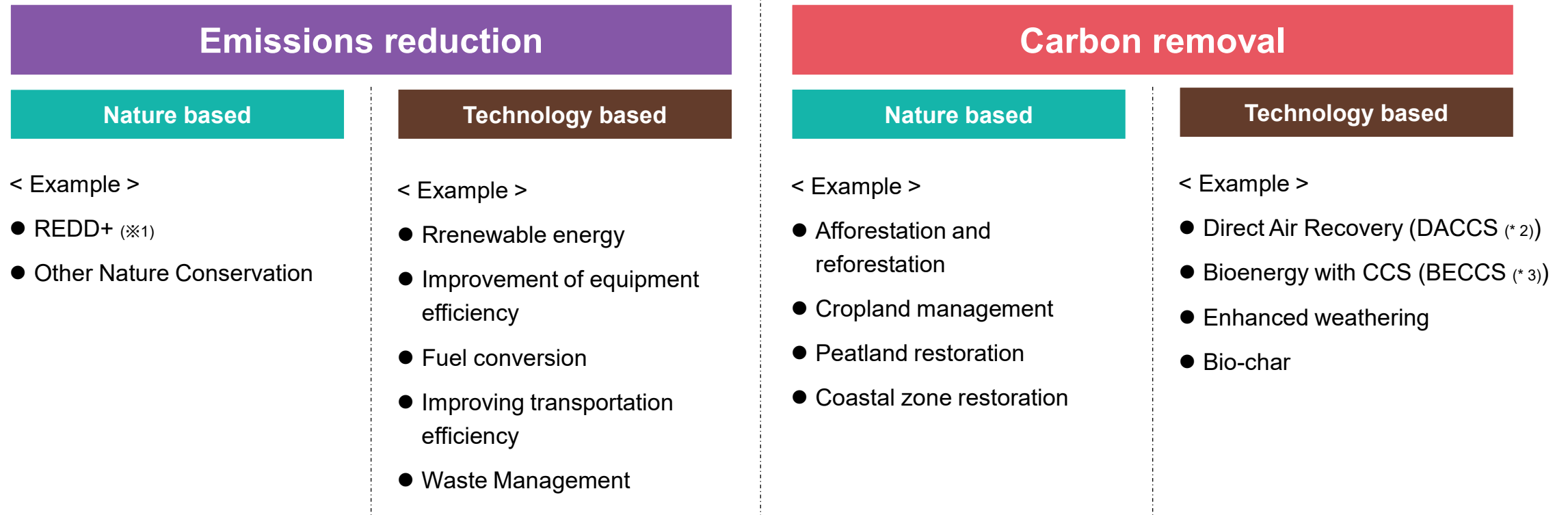


- CO2



Typology of carbon credits

◆ Credit types can be broadly classified into four categories.



(※1)REDD+:Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (Reducing emissions from deforestation and forest degradation in developing countries, as well as enhancing forest conservation, sustainable forest management, and forest carbon accumulation)

(※2) DACCS:Direct Air Carbon Capture and Storage

(※3) BECCS:Bioenergy with Carbon Capture and Storage

【Our activity example】Indonesia / Mangrove planting

- We are planting mangroves and generating voluntary carbon credits by working with VNV *2 and the local community.
- Mangroves are an important social infrastructure for the local community.
- This project enriches the local community by means of benefit sharing, biodiversity conservation while contributing to carbon sequestration.
- Mangroves are also natural shield protecting the community from natural disasters such as tsunamis.

*2 Value Network Ventures Advisory Services

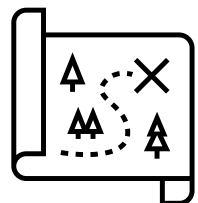
Partner	VNV Advisory
Project Type	Mangrove planting
Location	Sumatra, Indonesia
Crediting Period Term	20 Years
Estimated Removal/Reduction	0.6 Million Tonnes CO2e



Remote sensing application opportunities in PJ Development



Q : Where are the suitable locations in the project implementation?



■ Social aspect

- Collaboration and agreement with local communities
- Human rights and equity etc.

■ Technical aspect

- Proof that the project area has not been a mangrove ecosystem in the specific period (ex. 10 years) (Proof of additionality)
- Seedling survival rate (Ex. in the case of mangrove PJ, water depth, soil conditions, climate etc.)
- Avoidance of native ecosystem destruction (Ex. in the case of mangrove PJ, it is NOT appropriate to plant in seagrass or native mudflat area.)

Q : How to ensure accurate monitoring and permanence?



■ Accurate and efficient monitoring

- Accurate and reliable data acquisition in an efficient way

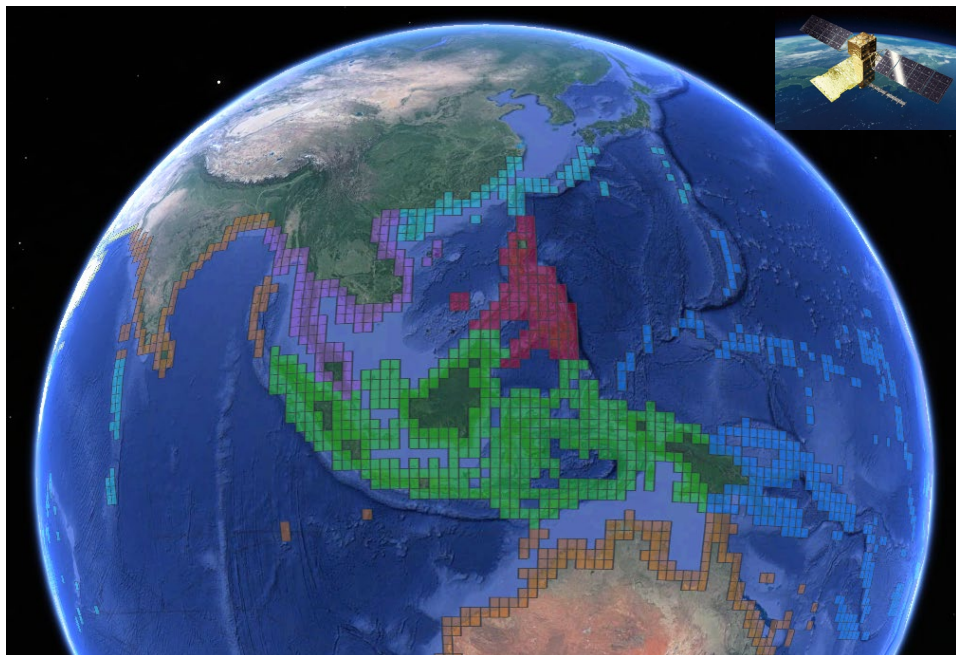
■ Permanence

- Detection of deforestation and degradation

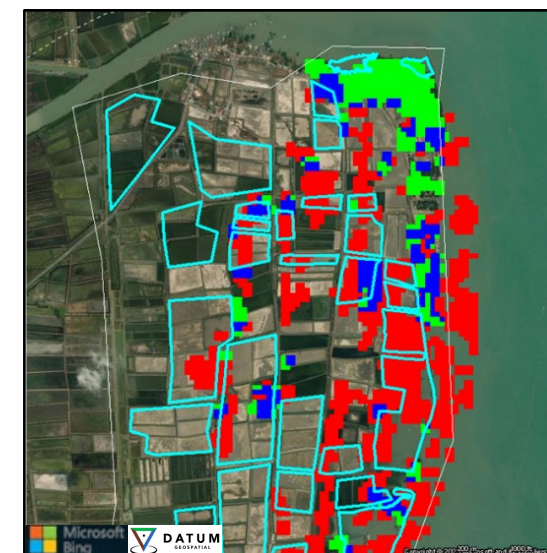
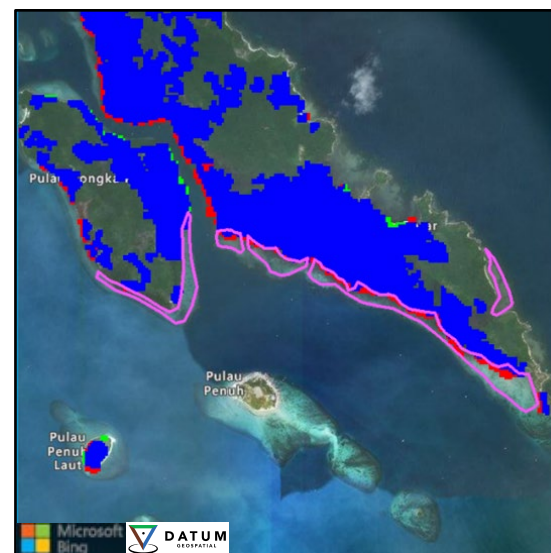
Remote sensing data application in Project Registration①

- ◆ To confirm and prove additionality and identify eligible areas, we analyzed the Global Mangrove Watch data.
- ◆ The Global Mangrove Watch was established in 2011 under JAXA's Kyoto & Carbon Initiative. The Global Mangrove Watch dataset provides maps of estimated global extent and changes of mangrove forests derived from for eleven annual epochs between 1996 and 2020.

Deep analysis of mangrove habitat change between 1996 and 2020



Source: JAXA, Global Mangrove Watch web page



- Stable mangrove area
- Mangrove declining area
- Mangrove increased area

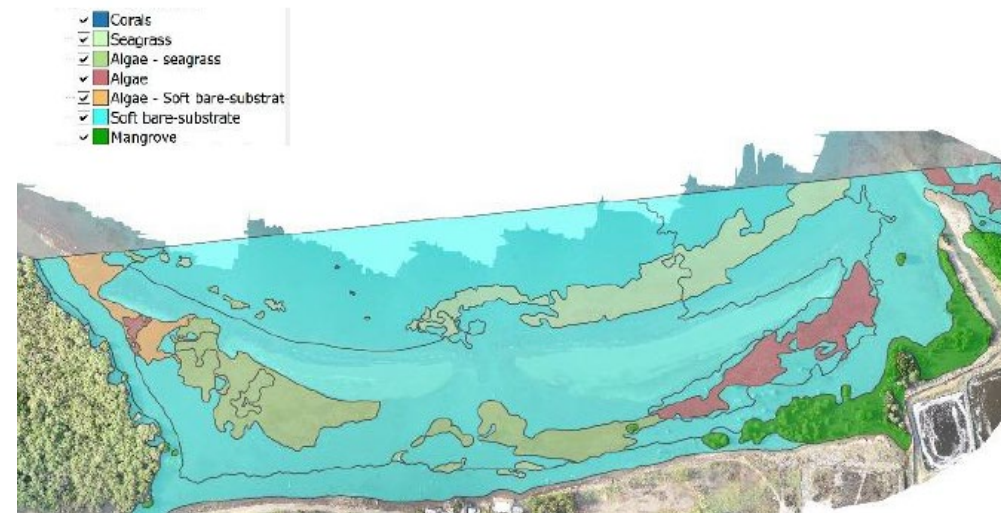
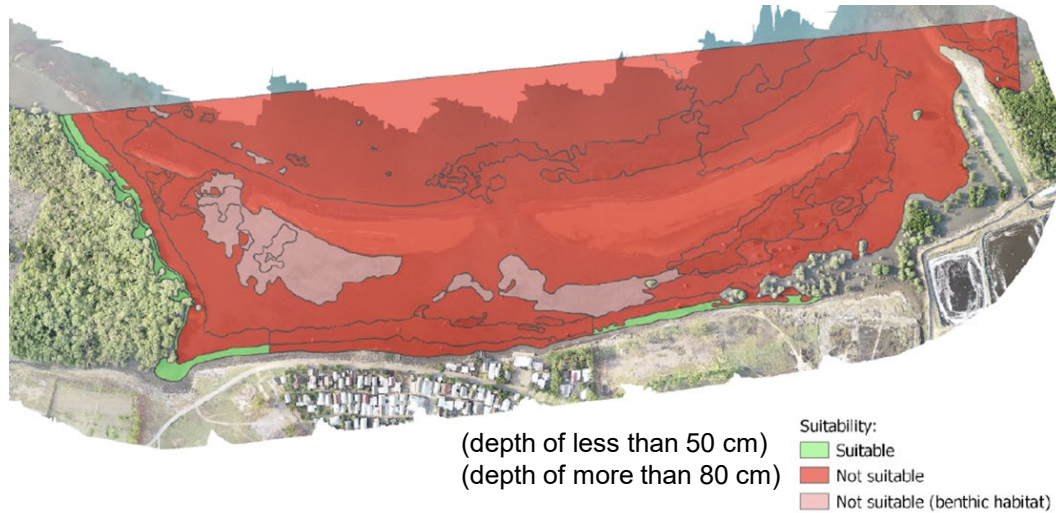
Remote sensing data application in Project Registration ②

Best practice guidelines for mangrove restoration



Source: Global Mangrove Alliance

- ◆ The Best Practice Guidelines for Mangrove Restoration, published in October 2023, mentions that mangrove planting in areas where the water level is too high, and in existing native ecosystems such as mudflats and seaweed/sea grass areas, will ultimately lead to project failure.
- ◆ In one of our feasibility studies, we analyzed the depth data (Water depth relative to mean sea level) and ecosystem maps of potential planting sites using satellite data and drone monitoring, and analyzed the best sites for planting **not only to ensure a suitable environment for mangrove growth, but also to meet the requirements for carbon credits and maintain high quality of carbon credits.**

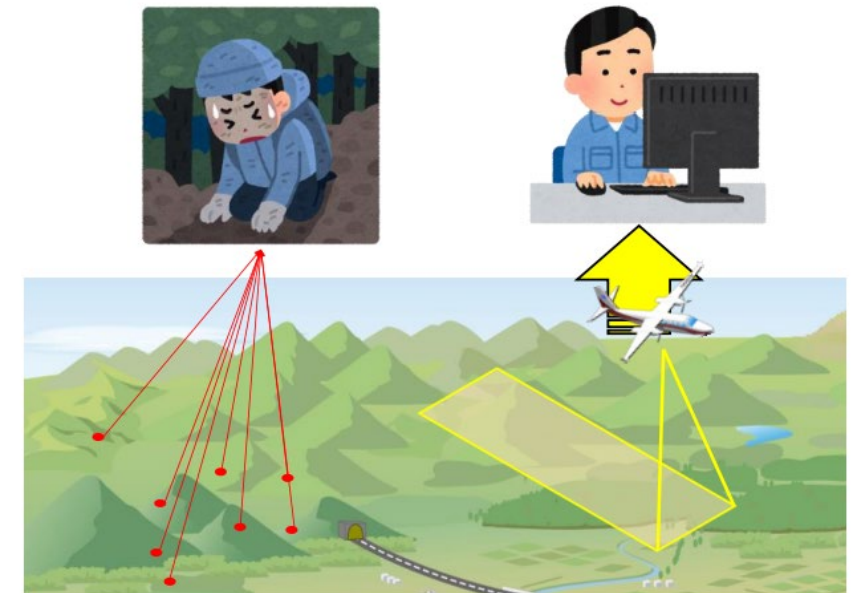


Towards the Future: Application in Carbon Credit Issuance ①

- ◆ In the traditional method, there is a method for monitoring forest sequestration that uses sampling (DBH, tree height, etc.) to determine the growth allometry equation for various tree species.
- ◆ Recently, more efficient methods using remote sensing have been introduced, but in some cases, the methods are limited to drone data or aerial laser measurement from the perspective of measurement accuracy.
- ◆ It is expected that the use of satellite data will be recognised in the future, and project implementers will be able to conduct monitoring more efficiently.

$$C_{PJ,RF,AG} = \sum_i C_{PJ,RF,AG,i} = \sum_i (Area_{Forest,RF,i} \times Trunk_{SC,RF,i} \times WD_i \times BEF_i \times CF \times \frac{44}{12})$$

Symbol	Definition	Unit
$C_{PJ,RF,AG}$	Removals by above-ground biomass until the stand reforested in the relevant fiscal year reaches the standard cutting age, etc.	tCO2
$C_{PJ,RF,AG,i}$	Removals by above-ground biomass until the class i stand reforested in the relevant fiscal year reaches the standard cutting age, etc.	tCO2
$Area_{Forest,RF,i}$	Area of the forest stand classified as class i where forest management (reforestation) is implemented in the relevant fiscal year after final cutting	ha
$Trunk_{SC,RF,i}$	Stem volume per unit of area in reforested class i stand standard cutting age, etc.	m3/ha
WD_i	Factor (volume density) for converting stem volume growth in class i to biomass (dry weight)	t/m3
BEF_i	Factor (expansion factor) for adding branch and leaf biomass to stem biomass in class i	—
CF	Factor for converting biomass amount (dry weight) to carbon amount (Carbon content)	—
i	Class of the forest by forest type (artificial forest, natural regenerated forest), tree species, forest age, site index, etc.	—

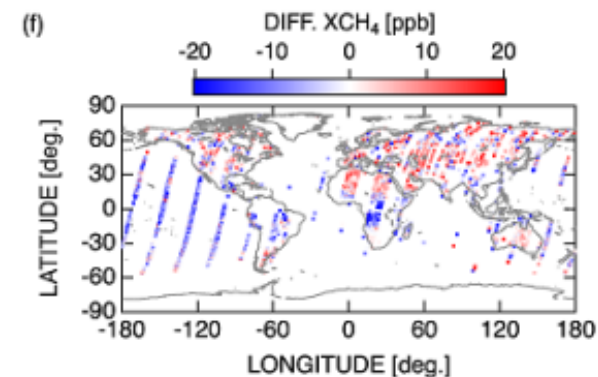
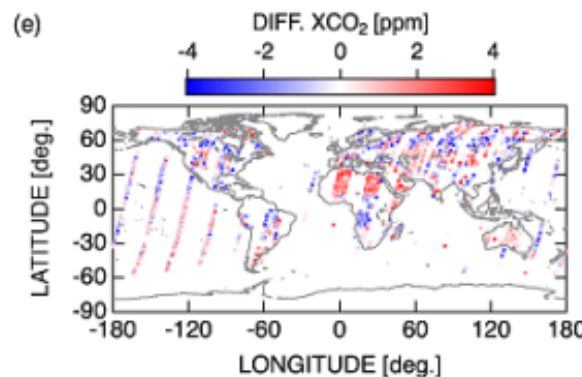


Source: Forestry Agency “Guidebook on remote sensing technology and its application methods for the development and practical use of high-precision forest information”

Towards the Future: Application in Carbon Credit Issuance②

- ◆ Not only CO₂, but also other GHG (such as CH₄, N₂O) are expected to be monitored more efficiently by remote sensing.
- ◆ For example, if the satellite data (e.g. GOSAT-2 project) can be used in the following activities, it can contribute to expanding the carbon credit market in the future.
 - CO₂ removals, CH₄ and N₂O emissions from mangrove ecosystem
 - CH₄ and N₂O emissions and reductions from rice paddy management PJ (e.g. AWD PJ)
 - CO₂ removals, CH₄ and N₂O emissions and reductions from regenerative agriculture PJ
 - CH₄ emissions from gas fields etc.

Study on consistency of greenhouse gas concentrations between GOSAT and GOSAT-2
– Efforts to develop long-term data sets on greenhouse gas concentrations using the GOSAT series –



Source: JAXA/NIES, GOSAT/GOSAT-2 page

Enriching lives and the world