Sustainable Development through Blue & Red Economy in PNG.

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Environmental Science and Sustainable Development-UPNG

17TH August 2023

1. Introduction- Climate Change and Impacts

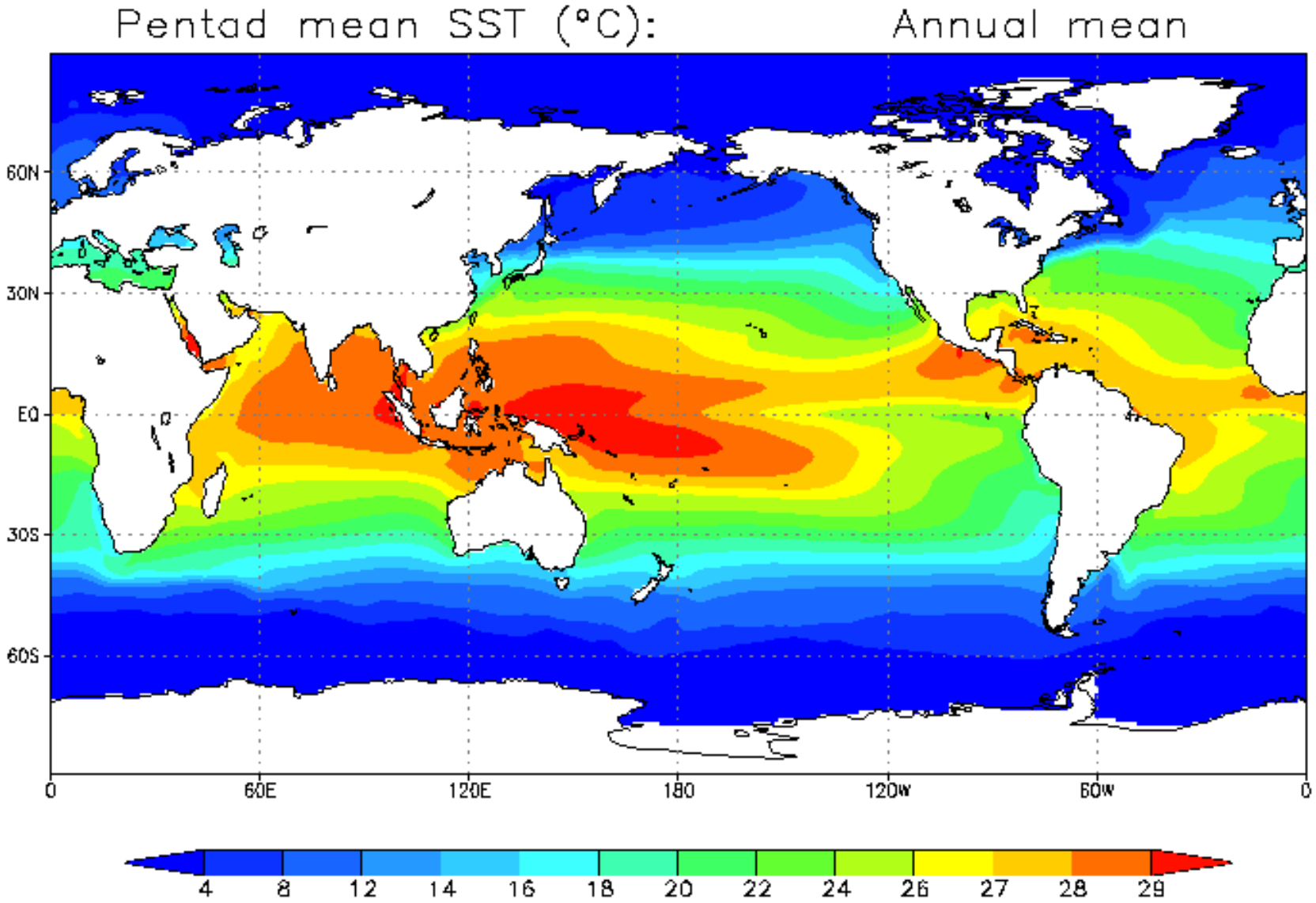
2. BLUE & GREEN Economy

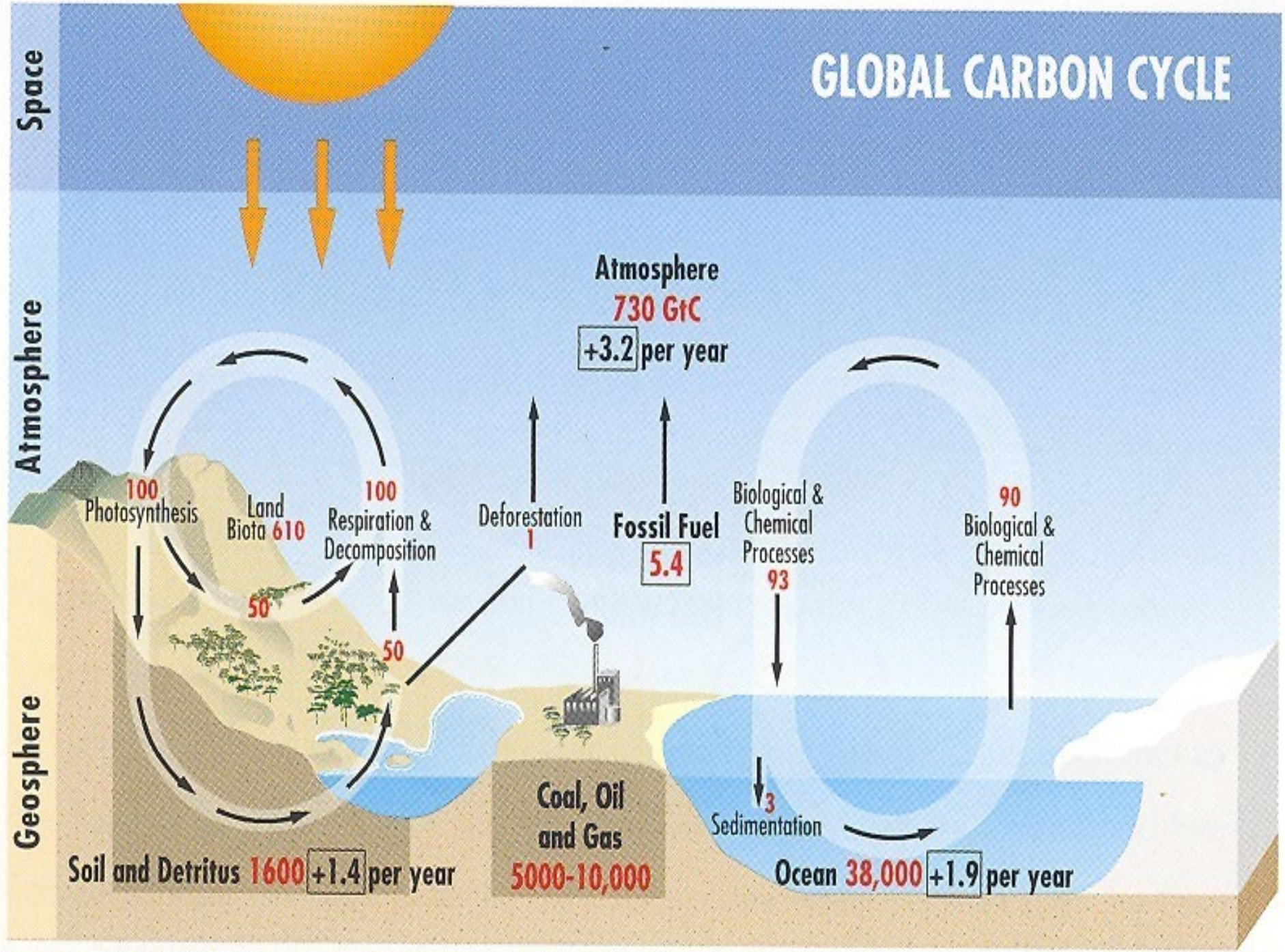
3. Sustainable Development-Model

4. Partnerships- UPNG, TEM and Manus Province

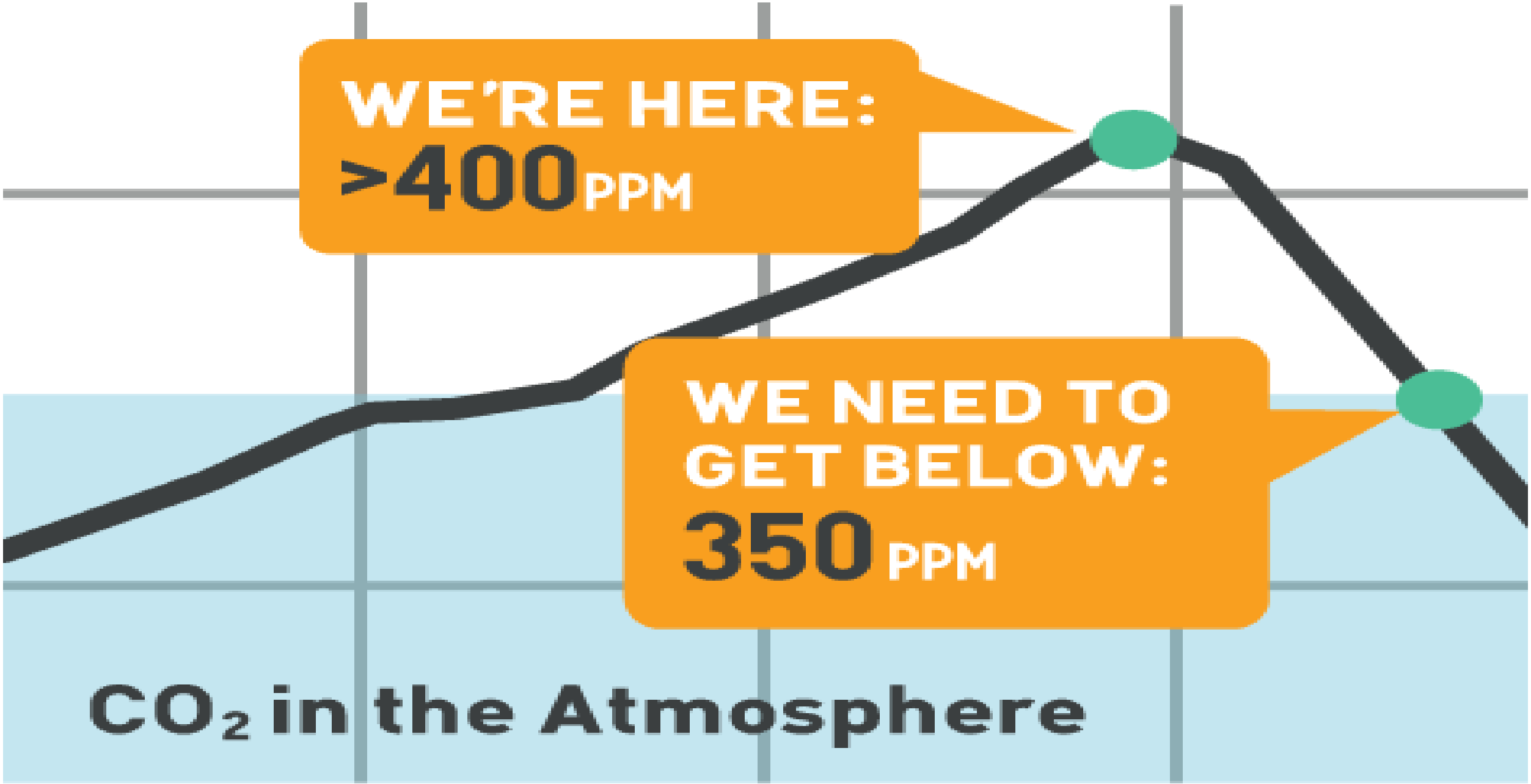
5. Summary

TEM


Pentad mean SST (°C):
Annual mean
60N
30N
EQ
30S
60S
0
60E
120E
180
120w
60w
0
4
8
12
14
16
18
20
22
24
26
27
28
29


GLOBAL CARBON CYCLE
Space
Atmosphere
Geosphere
Atmosphere
730 GtC
+3.2 per year
100
Photosynthesis
Land
Biota 610
100
Respiration &
Decomposition
Deforestation
1
Fossil Fuel
5.4
Biological &
Chemical
Processes
93
90
Biological &
Chemical
Processes
50
50
Coal, Oil
and Gas
5000-10,000
3
Sedimentation
Soil and Detritus 1600 +1.4 per year
Ocean 38,000 +1.9 per year

COP 26


WE'RE HERE:
>400 PPM
WE NEED TO GET BELOW:
350 PPM
CO_2 in the Atmosphere

PARIS AGREEMENT 2015

BRIEF

Over the 2015 in Paris, two weeks of negotiations culminated in the adoption by parties to the United Nations Framework Convention on Climate Change of a conference decision and Paris Agreement to address climate change. The combined Paris Outcome commits parties to limit global temperature rise to ‘well below 2°C’ with an aspirational target of a 1.5°C limit.

How does it affect you?

The Paris Agreement commits parties to hold the increase in global average temperature to 'well below 2°C above pre-industrial levels'.

The Agreement includes a mechanism for parties to review their nationally determined contributions every five years, with increasing ambition.

The Paris Outcome includes a work program and measures for enhanced action prior to 2020, as well as recognition of the importance of non-state actors, including business and sub-national governments in addressing climate change.

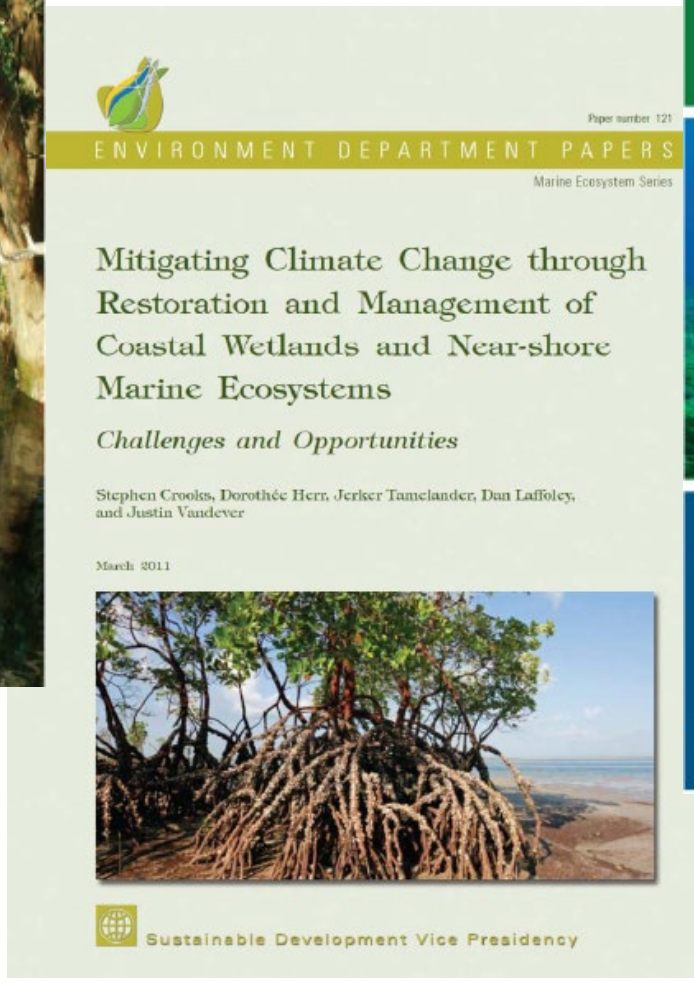
The Paris Outcome along with the series of innovation announcements and commitments made during COP21 will increase focus on clean energy

International Blue Carbon WG (CI, IUCN, UNEP, World Bank)

USAID FROM THE AMERICAN PEOPLE

LEAF Lowering Emissions in Asia's Forests

Mangrove Conservation

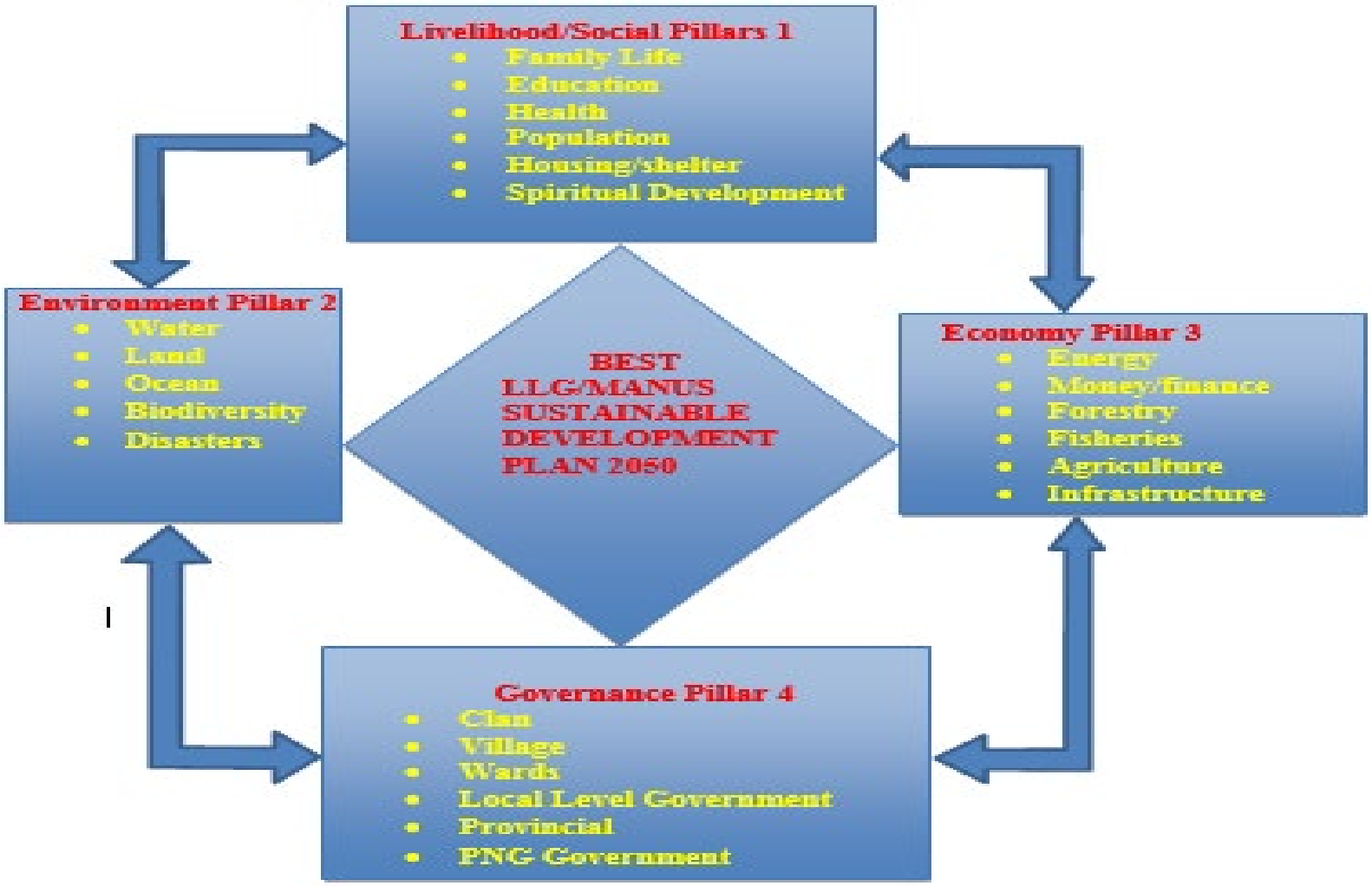


Manus Blue Carbon Project Overview

TEM

Methodology

Conceptual Framework – Manus Sustainable Development Framwork



Governance: Where do we begin?

BOTTOM UP APPROACH

BUILDING GREATER AUTONOMY

1. **CLAN LAND BOUNDARY MAPS**
2. **CLAN/TRIBE PROFILE**
3. **SOCIOECONOMIC PROFILE**
4. **BIODIVERSITY/ ENVIRONMENT PROFILE**

5. **RAPATONA LLG SUSTAINABLE DEVELOPMENT PLAN 2022 -2032**

Agenda

1. Introduce the team
2. Importance of mangroves and status on Manus Island
3. Project stages
4. Project concept
5. Discussion

Project Partners

TEM

Project Lead - design, approvals, funding and implementation

UPNG Environmental Science & Geography – Sustaining Our Livelihood

Stakeholder Engagement and Blue Carbon Research

James Cook University Australia – TropWATER

Blue Carbon Science & Project Design

ADATOS.AI

Advanced Remote Sensing Applications

Support from the Manus Provincial Government

Tasman Environmental Markets (TEM)

- There is rapidly growing demand by big organisations to act on climate change
- TEM empowers businesses and consumers to achieve carbon emission reductions and make extraordinary impact by connecting them to life-changing carbon reduction projects
- TEM partners with iconic brands to achieve their carbon neutral and net zero emissions goals

Our Partners

"With the help of TEM to make careful project selections, offsets provide a way for us to take immediate action to slow climate change while we partner with our clients and suppliers on the challenging and material task of removing emissions directly from our construction activities and materials."

Ann Austin, National Sustainability Manager
Lendlease Building

Australian Carbon Industry Code of Conduct SIGNATORY

Certified B Corporation

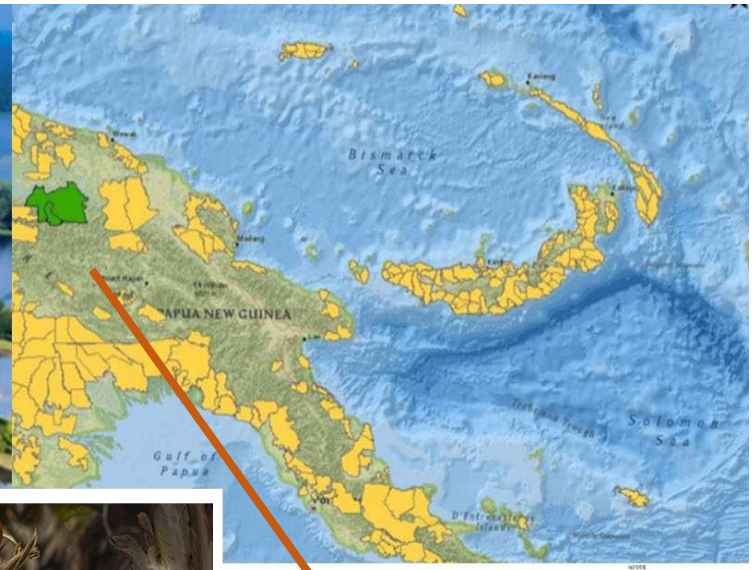
Climate Active Carbon Neutral ORGANISATION

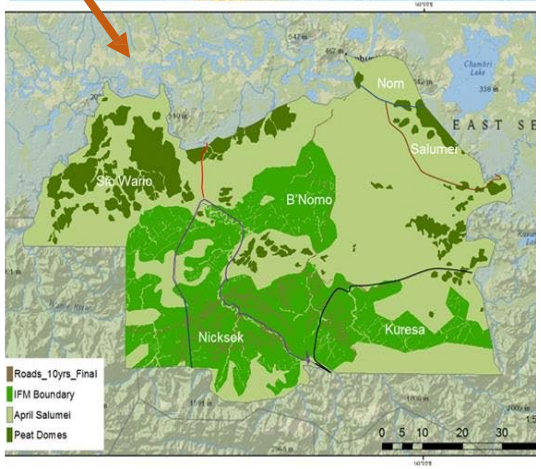
Qantas Future Planet · Air Niugini · webjet.com.au · Singapore Airlines · Deakin University Australia · Australia Post · lendlease · energetics · Aesop · QBE · Woodside · EarthWatch Institute · Lion · AllianceBernstein · NEXTDC · Hanes Brands Inc · KFC · Voyager Estate · Fraser Property · HESTA · Sydney Fish Market · Air Vanuatu · Tomahawk · pacific national · Brisbane Airport · Suncorp · Intrepid · shebah · GE · DHL · cua · Allens › ‹ Linklaters · SmartWays · UniSuper · American Express Global Business Travel · T2 · FMG Fortescue The New Force in Iron Ore · Fujitsu

April Salumei REDD+, PNG

TEM

pacific forest ALLIANCE





Reduced Emissions from Deforestation and Degradation (REDD)

Agriculture Forestry and Other Land Use (AFOLU)

Crediting period

38 years

Project area

603,712 hectares

Biodiversity

> 380 species of birds and mammals

Avoided emissions

(Second verification period 2014-18)

1,848,434 tCO_2

UN Sustainable Development Goals

Cookstoves Project, PNG

Installation of high efficiency firewood cookstoves (VMR0006)

UN Sustainable Development Goals

Step 1 — Technology

Step 2 — Avoided emissions

Step 3 — Pilot Study (underway)

Step 4 — Financial model

Step 5 — Investment approval

Step 6 — Project submission

Step 7 — Project delivery

Avoided emissions
Estimated *5-7 tCO_2 per ICS/annum*

Verified Carbon Standard

University of PNG

University of Papua New Guinea

- Prof. Chalapan Kaluwin and Dr. Lavong Balun (UPNG team)
- In 2014 commenced research on Climate Change linked to the Blue Carbon market in PNG, the Pacific, and now the Manus Island Province
- Started Blue Research in RAPATONA LLG in 2020 measuring Blue Carbon stocks of mangrove and seagrass, and estimating Biodiversity abundance and conservation status

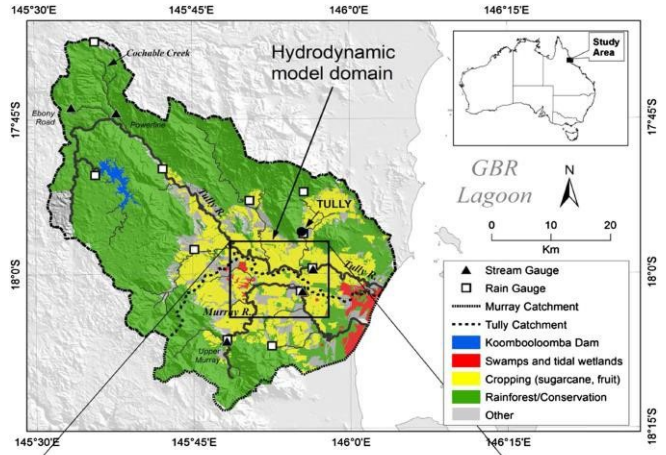


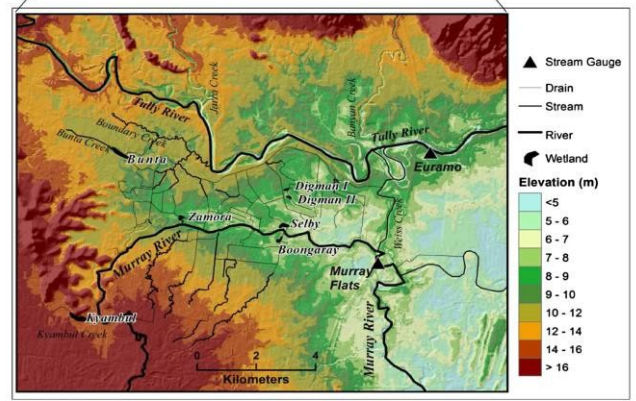

James Cook University

JAMES COOK UNIVERSITY AUSTRALIA

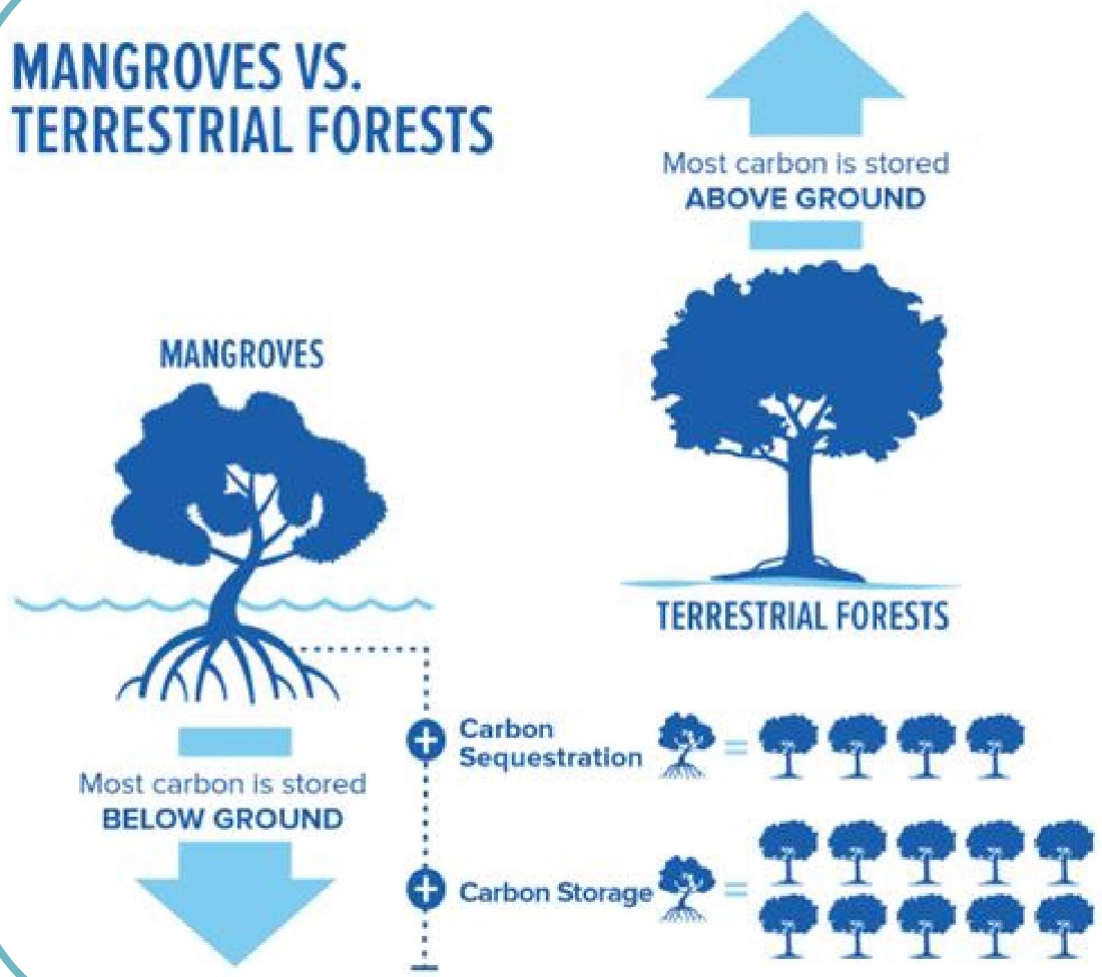
TropWATER
Centre for Tropical Water and Aquatic Ecosystem Research

- JCU ranked 1 in the world for marine science
- Cutting edge restoration research with impact
  - 15 fisheries habitat restoration
  - 4 large blue carbon research projects (>1000ha)
  - 10 restoration projects for water quality
  - 5 spatial habitat modelling
- Latest technology and artificial intelligence
- Team of 10 staff (Scientists and field techs)





The Importance of Mangroves



Blue Carbon

IUCN Verified Carbon Standard

Terminology for carbon captured by oceans and coastal ecosystems

Mangroves are 10 times more efficient than forests in storing CO_2

Mangroves damaged by human activity release their accumulated CO_2 contributing to Climate Change

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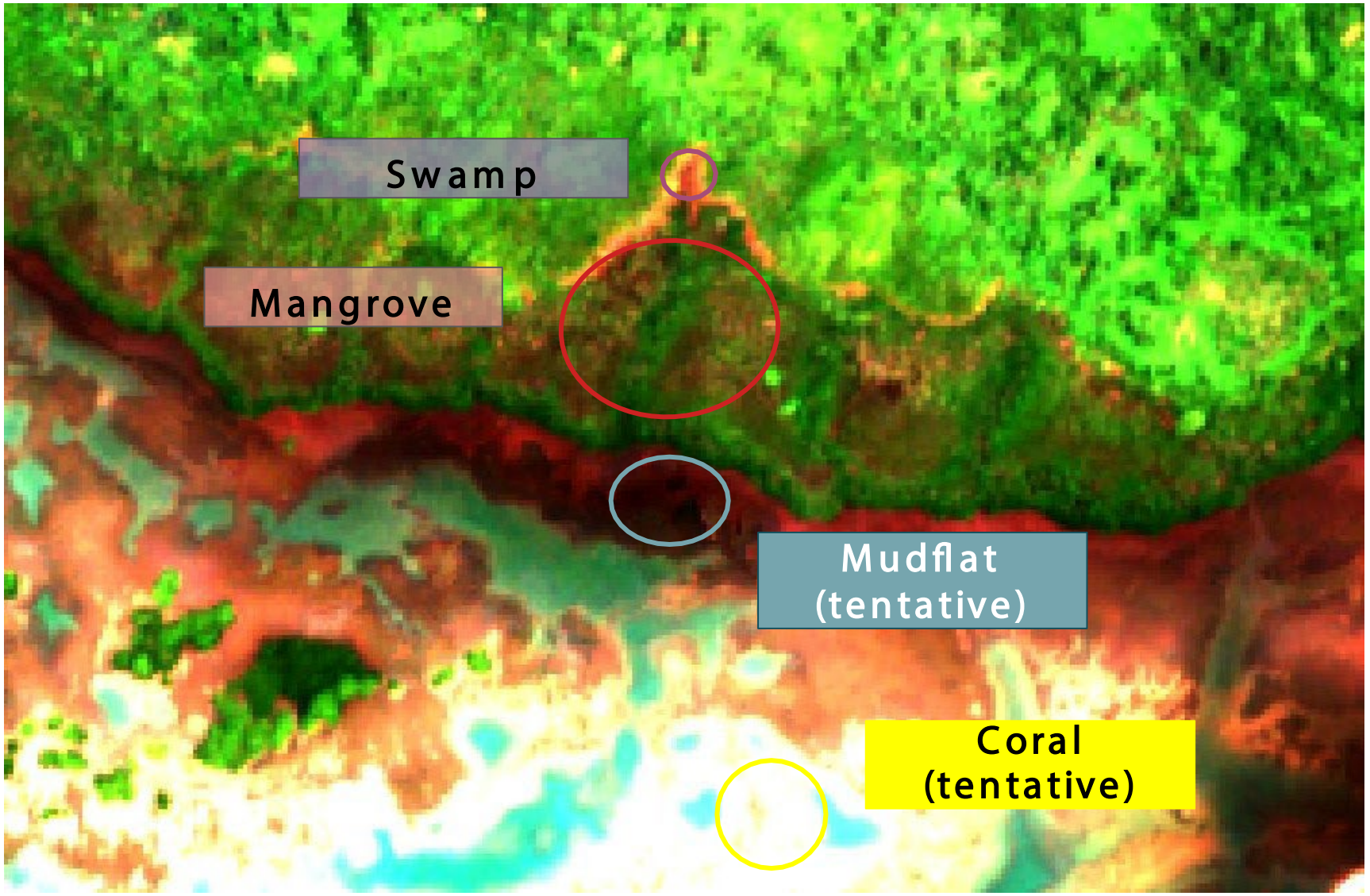
Classiffication Based on Remote Sensing

True Colour

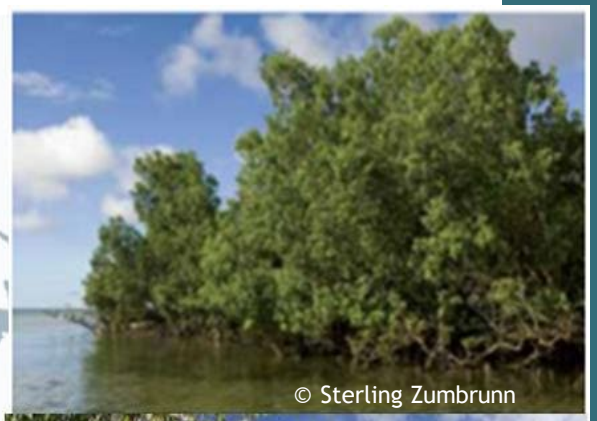
Note: Corals are not part of the proposed land cover classification but an alignment on the differentiation of corals and mudflats would be required for accurate classification of mudflats



Current Status of Mangroves

- Estimated 67% of loss of historical mangrove forests worldwide
- Degradation of mangrove forests occurs faster than tropical rainforests
- Mangrove forests clearing for fuelwood
- Frequent erosion and flooding by King tides (e.g., 2008, 2021 in the Pacific)
- Lack of monitoring systems
- Absence of policies to support sustainable coastal management

Mangrove Ecosystems in PNG



Mangroves surface
417,229 hectares

Mangrove surface Worldwide
Ranked 4th

Estimated tonnes of C Storage
223,096,105

Global C storage Worldwide
5.32%

Source: Hamilton & Friess 2018_Global Carbon stocks from mangroves

Manus Island Mangroves – Preliminary assessment

Mangroves in Manus and Los Negros Islands

Remote sensing data

2000-2022
Landsat 7, Sentinel 1 & 2

Mangroves

5,760 hectares

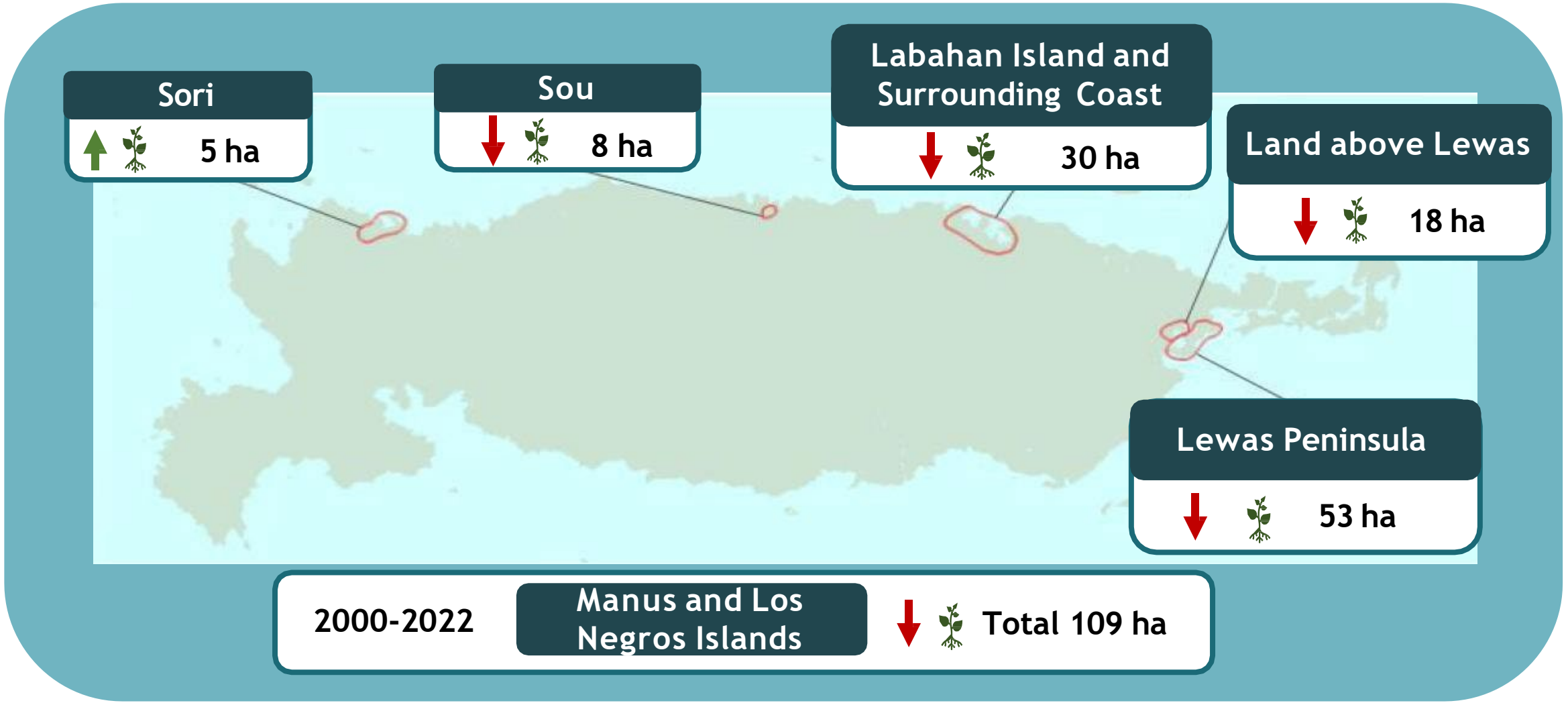
Estimated tonnes of CO2 stored

9,881,424

Hamilton & Friess 2018

Sources: Hamilton & Friess 2018_Global Carbon stocks from mangroves

Preliminary analysis - Manus Island mangroves 2000-2020



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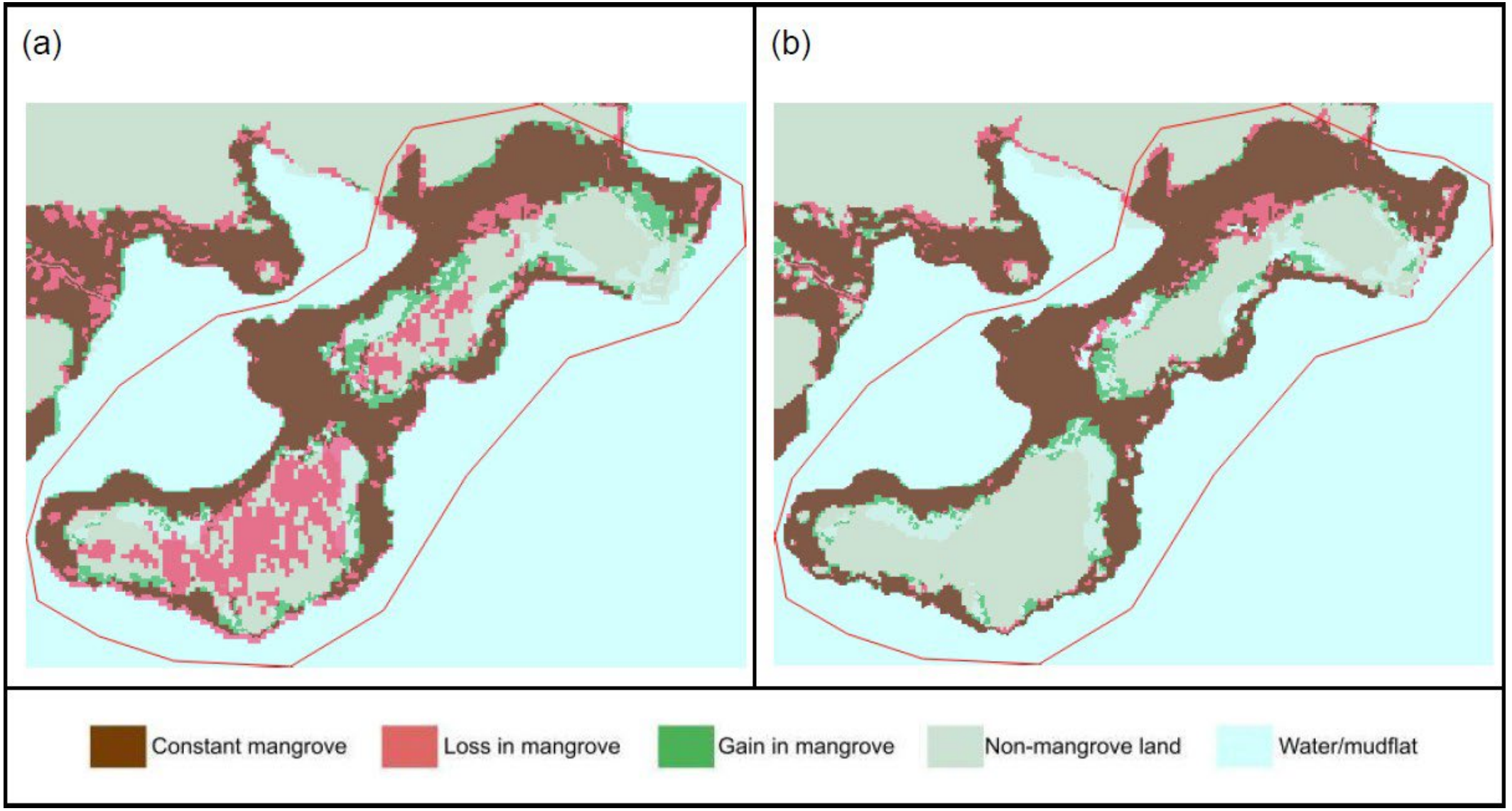
Preliminary analysis 2000-2020 (Lawas)



Impacts on Manus (Lawas)

Impacts on Manus (Lobahan and Airport Rd)

Integrated Blue Carbon Project
First in PNG (- model project)

- **Education** of the local communities on **mangrove protection, conservation and integrated agriculture**
- Address **human induced impacts** on mangroves - clearing for **housing, firewood, agriculture, infrastructure** (eg road design, drainage)
- Develop a **management plan** to establish areas for **mangrove protection and restoration (eg Rapatona, Labahan)** with partners (UPNG, TNC)
- Work with the National and Manus Provincial Governments, LLGs, ward and clans to develop **policy for coastal management**

TEM

Key Stages for a successful Manus Integrated Blue Carbon Project

1. Prepare the Project Concept and undertake preliminary research
2. Sign an MOU with Manus Provincial Government
3. Undertake a Feasibility Study
    a) Stakeholder Engagement – MPG, CCDA, LLGs/landowners, etc
    b) Project Design Document
    c) Project Cost & Finance
    d) Investment Plan (community benefit and mangrove restoration)
    e) Project Approvals
4. Sign a Project Development Agreement with MPG
5. Project Implementation (team based on Manus)
6. Project Monitoring & Evaluation

Contact us