CTCN Technical Assistance for

Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa

Inception Workshop
National Institute of Green Technology
August 4, 2023

Background of the project

01 Samoa's ratification of the UNFCCC in 1994

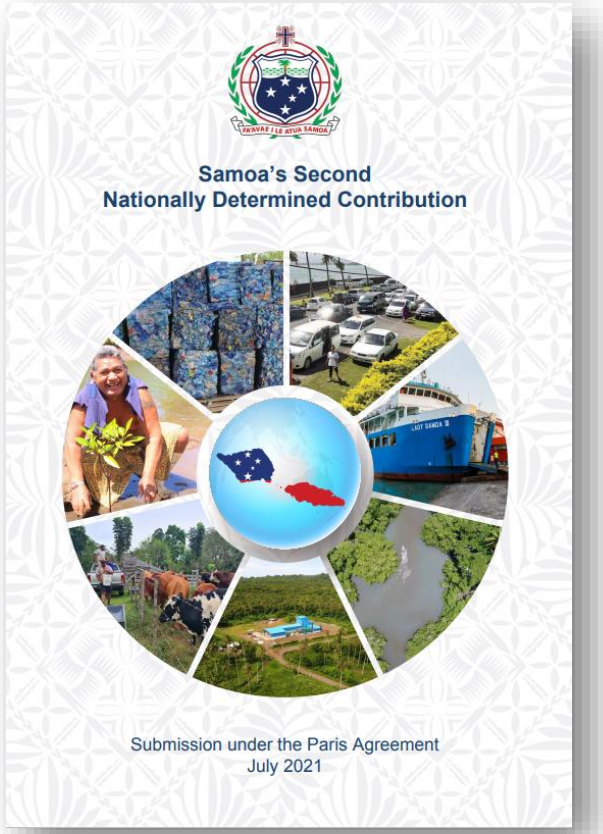
- Article 4.1(d): Samoa is obliged to enhance sinks and reservoirs of GHG, including forests and other terrestrial, coastal and marine ecosystems

02 Samoa updated the NDC in 2021

- Samoa aims to expand the area under agroforestry to an additional 5% of the agricultural land by 2030 (relative to 2018)
- Samoa aims to manage forests sustainably and increase total forest cover by 2% by 2030 (relative to 2013)

03 The Samoa's 2nd GHG inventory in 2022

- Samoa's existing forests are an important carbon sink and could absorb up to 800,000t CO2 annually



Necessity of Sustainable Forest Management in Samoa (1)

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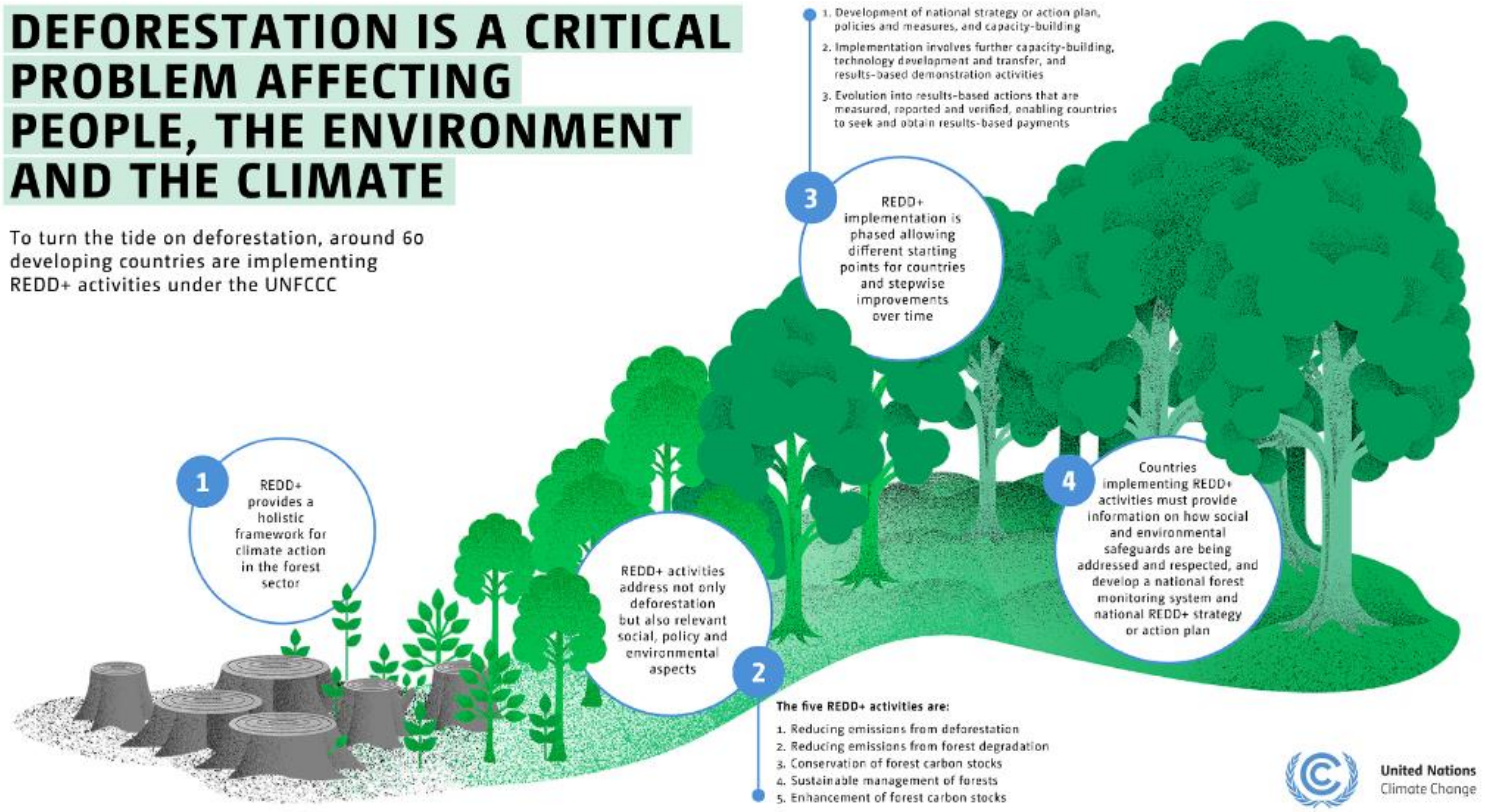
Why deforestation matters?

- **Significant sources of carbon emissions.** Up to 11 per cent of carbon emissions are caused by deforestation and forest degradation (UN-REDD Programme)
- **Forests are valuable in many other ways.** Water regulation, soil protection, non-timber forest products including food and fibre, climate regulation and biodiversity – 1.6 M people depend on forests



Necessity of Sustainable Forest Management in Samoa (2)

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Why sustainable forest management for Samoa?

- **Significant sources of carbon emissions**
  - ✓ Up to 11 percent of carbon emissions are caused by deforestation and forest degradation (UN-REDD Programme)
  - ✓ Forest carbon sinks for VCM (Verified Carbon Market) – RBP (result-based payment)
  - ✓ NBS (Nature-Based Solutions) for achieving NDC (Nationally Determined Contributions) - reduce GHG emissions in the AFOLU sector by 26 percent in 2030 compared to 2007 levels (or by 35.2 Gg CO_2 e compared to the new reference year once the GHG emissions inventory is updated)

- **Forests are valuable in many other ways**
  - ✓ Water regulation, soil protection, non-timber forest products including food and fibre, climate regulation and biodiversity
  - ✓ Manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013 (NDC adaptation target)

About REDD+ (1)

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What is REDD+?

- Defined as "reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks" (UN-REDD Programme)

- REDD+ aims to incentivize developing countries to contribute to climate change mitigation actions in the forest sector by:
  - ✓ reducing carbon emissions from deforestation;
  - ✓ reducing carbon emissions from forest degradation;
  - ✓ conservation of forest carbon stocks;
  - ✓ sustainable management of forests; and
  - ✓ enhancement of forest carbon stocks

About REDD+ (2)

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What are the phases of REDD+?

Phase 1: Readiness

Countries design national strategies and action plans with relevant stakeholders, build the capacity to implement REDD+, work on REDD+ related policies and measures, and design demonstration activities.

Phase 2: Demonstration

National strategies, policies and action plans proposed in Phase I are demonstrated and tested. This may include results-based demonstration activities and may require additional capacity building, technology development and transfer.

Phase 3: Implementation

Results-based actions are implemented at the national level and results are fully measured, reported and verified. Countries can access results-based payments when they have completed the reporting, assessment and analysis processes under the UNFCCC.

About REDD+ (3)

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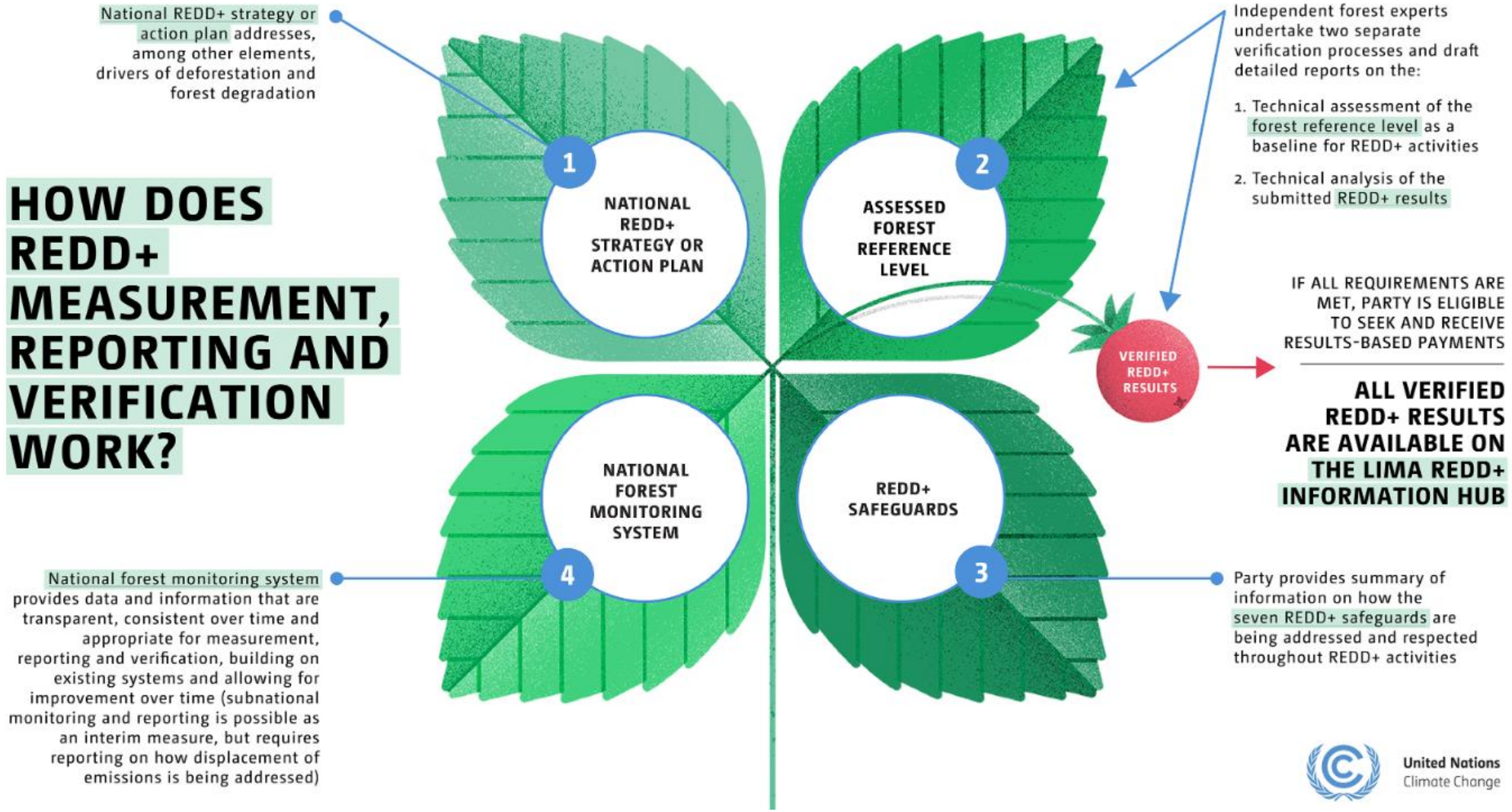
What is REDD+ readiness?

- Refers to the efforts a country undertakes to develop the capacities needed to demonstrate and implement REDD+, and meet UNFCCC REDD+ requirements

- REDD+ readiness support is provided to developing countries through bilateral and multilateral initiatives, including both financial and technical support on REDD+ related areas of work
  - ✓ governance
  - ✓ stakeholder engagement
  - ✓ developing a REDD+ national strategy/action plan
  - ✓ designing a safeguards information system
  - ✓ developing a forest emission reference level and a national forest monitoring system

About REDD+ (4)

What are the elements of REDD+?



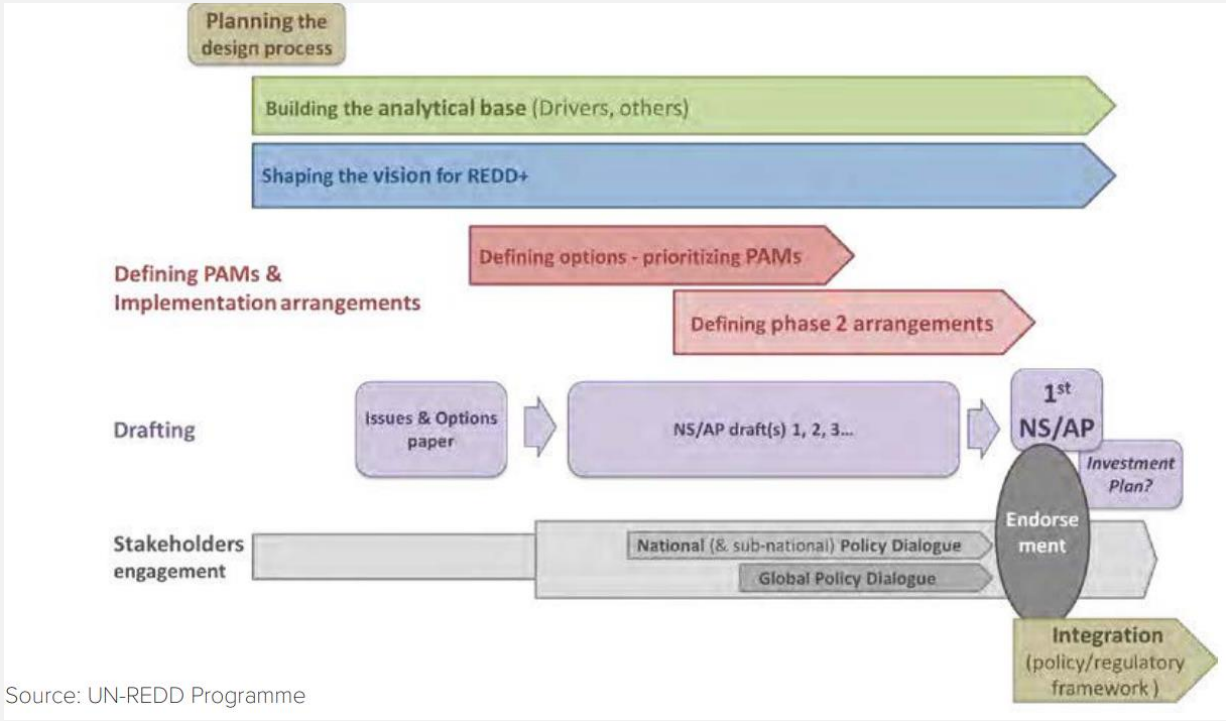
About REDD+ (5)

1. National Strategy (NS) or Action Plan (AP)

- The process of developing a NA/AP may be broken down into several key elements.
  These elements are by no means fully sequential, and many should actually progress in parallel, with regular interactions and feedback loops.

NS/AP design process

- ✓ Planning the NS/AP design process
- ✓ Building the analytical base
- ✓ Building a REDD+ vision
- ✓ Analysing options and defining PAMs
- ✓ Defining implementation arrangements (financial, legal and institutional)
- ✓ NS/AP drafting
- ✓ Political and stakeholder endorsement
- ✓ Integration of the NS/AP into the policy/regulatory framework



Source: UN-REDD Programme

About REDD+ (6)

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2. Forest Reference Emission Level (FREL)

- **FREL considerations**: 1) Forest definition, 2) Scope, 3) Scale, 4) Data and methodologies (UNFCCC Guidance)

1) Forest definition

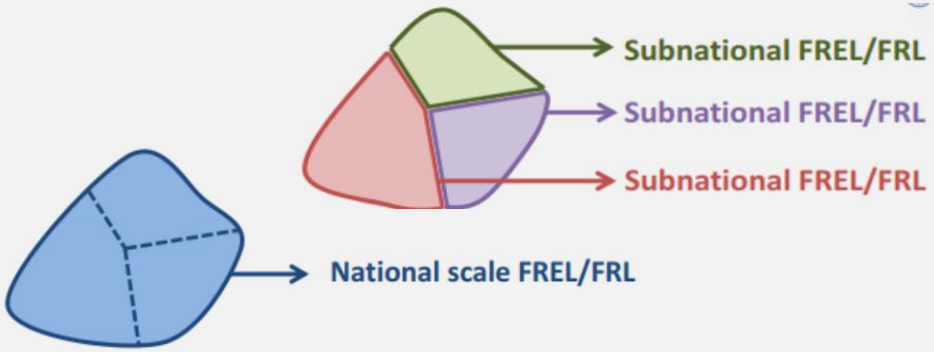
A country must provide a definition of forest
- minimum tree crown cover (%)
- minimum land area (ha)
- minimum tree height (m)

2) Scope

mitigation potential
REDD+ strategy
technical capacity (accuracy, cost)

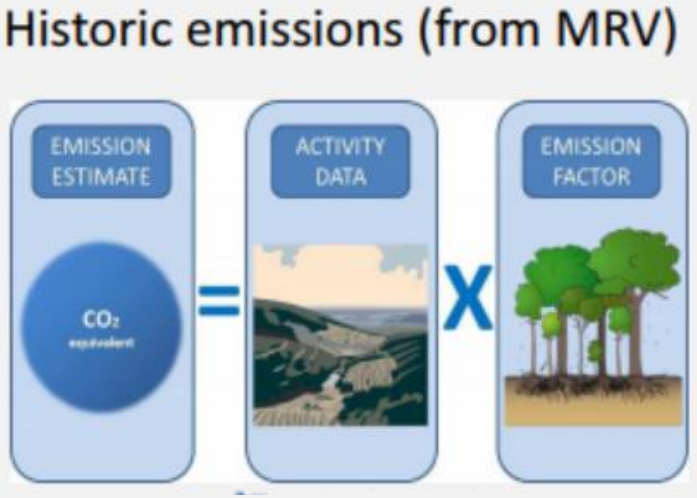
3) Scale

REDD+ can be implemented at multiple levels (national, sub-national)



4) Data and methodologies

Historic data
consistency between MRW and FREL/FRL



About REDD+ (7)

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3. National Forest Monitoring System (NFMS)

- The key to any functional measurement and reporting of forest carbon is **reliable data of forest area and forest area changes.**

How is forest monitoring carried out? – Malaysian case

Type of Monitoring	Method	Frequency	Outcome
Remote Sensing	Geospatial imagery is captured from satellites	Once every 2 years	Determine changes to overall forest cover (percentage of land covered by forest) and forest density
On-Ground Observation	A national forest inventory is carried out, with personnel collecting samples from forests	Once every 10 years	Create a detailed assessment of the volume of carbon stocks in forests

About REDD+ (8)

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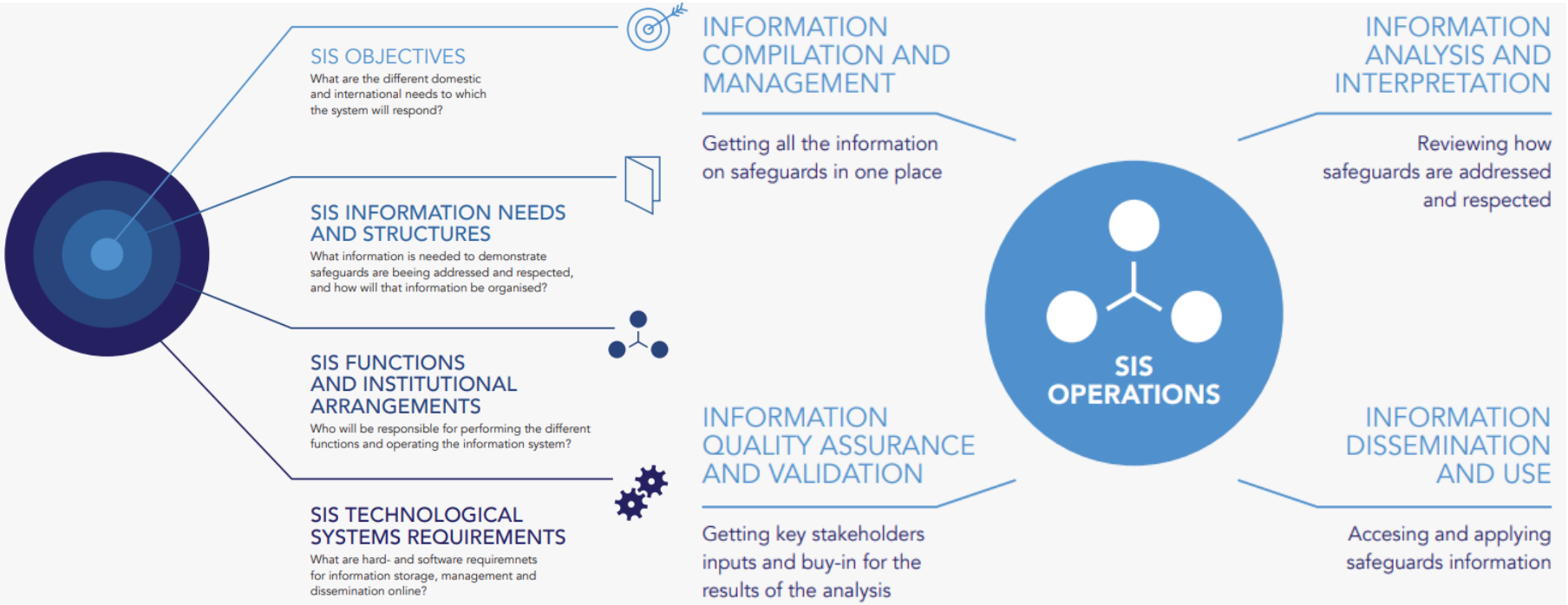
4. Safeguard Information System (SIS)

- Some general characteristics of the SIS under the UNFCCC (Decision 12/ CP.17, paragraph 2)
  1. **provide transparent and consistent information** that is accessible by all relevant stakeholders and updated on a regular basis;
  2. **be transparent and flexible** to allow for improvements over time;
  3. **provide information** on how all of the safeguards are being addressed and respected;
  4. **be country-driven** and implemented at the national level; and
  5. **build upon existing** systems, as appropriate



Considerations
for SIS design and operation
(UN-REDD Programme)

Needs of the CTCN TA

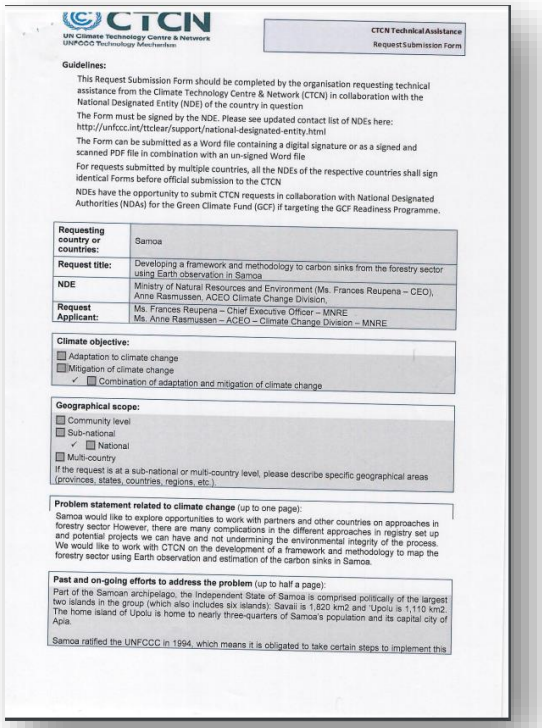
Past initiatives

Initiatives to improve the forest management and lower the deforestation rate in Samoa

- Vegetation Mapping pf Samoa (2011)
- Samoa's Forest Resources: Forest Inventory and Analysis (2012)
- Vegetation Mapping Inventory Project for National Park of Samoa
- National Forest Inventory (2013)
- GHG inventory (2022)

Status

- Previous initiatives have not made to map the forest of Samoa and to estimate the carbon sinks of Samoa
- Carbon credits and carbon sequestration are yet to be conceptualized
- Public education and awareness raising are required



CTCN
UN Climate Technology Centre & Network
UNFCCC Technology Mechanism

CTCN Technical Assistance
Request Submission Form

Guidelines:

This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question

The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html

The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file

For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN

NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	Samoa
Request title:	Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa
NDE	Ministry of Natural Resources and Environment (Ms. Frances Reupena – CEO), Anne Rasmussen, ACEO Climate Change Division,
Request Applicant:	Ms. Frances Reupena – Chief Executive Officer – MNRE Ms. Anne Rasmussen – ACEO – Climate Change Division – MNRE

Climate objective:

☐ Adaptation to climate change
☐ Mitigation of climate change
✓ ☐ Combination of adaptation and mitigation of climate change

Geographical scope:

☐ Community level
☐ Sub-national
✓ ☐ National
☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

Samoa would like to explore opportunities to work with partners and other countries on approaches in forestry sector However, there are many complications in the different approaches in registry set up and potential projects we can have and not undermining the environmental integrity of the process. We would like to work with CTCN on the development of a framework and methodology to map the forestry sector using Earth observation and estimation of the carbon sinks in Samoa.

Past and on-going efforts to address the problem (up to half a page):

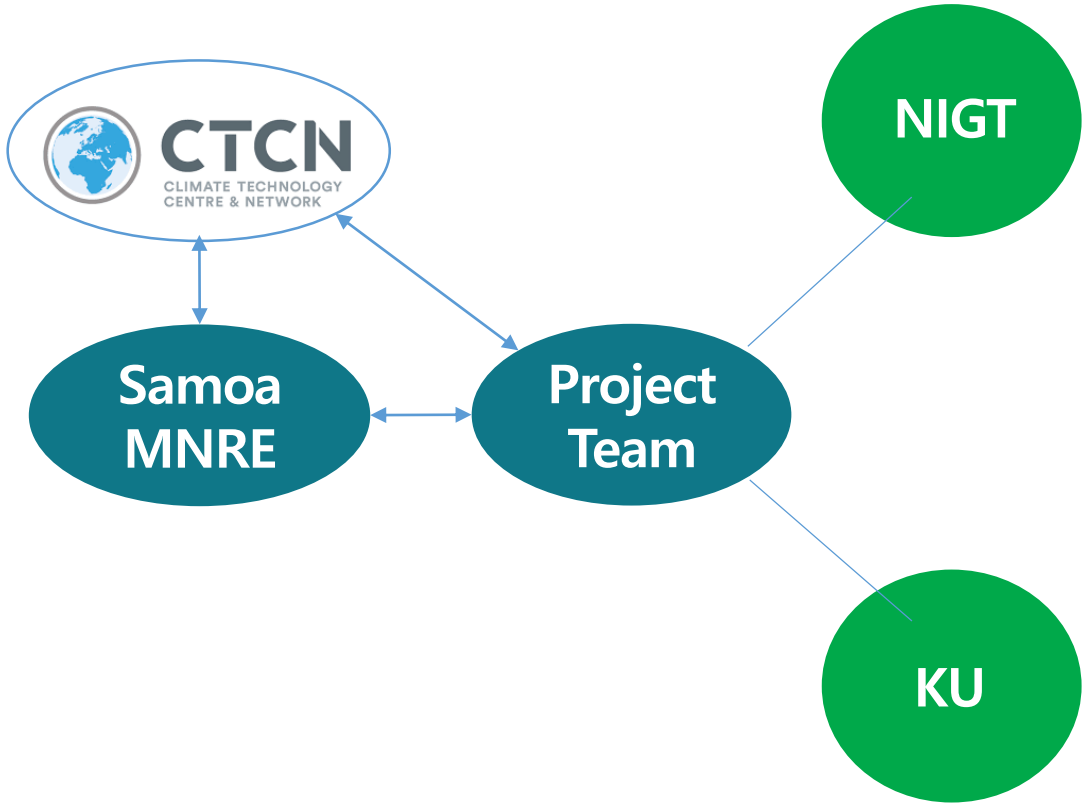
Part of the Samoan archipelago, the Independent State of Samoa is comprised politically of the largest two islands in the group (which also includes six islands): Savaii is 1,820 km2 and 'Upolu is 1,110 km2. The home island of Upolu is home to nearly three-quarters of Samoa's population and its capital city of Apia.

Samoa ratified the UNFCCC in 1994, which means it is obligated to take certain steps to implement this

Project Overview

Title	CTCN Technical Assistance for developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa
Background	NDE and Proponent(MNRE), Ms. Frances Reupena and Ms. Anne Rasmussen, submitted the TA request to the CTCN
Consortium	National Institute of Green Technology Korea University, OJEong Resilience Institute
Duration	Oct. 01, 2022 – March 30, 2024 (18 months)
Objectives	• Developing a framework and methodology to map the forestry sector using Earth Observation and estimation of the carbon sinks in Samoa • Identifying possible issues and opportunities of using REDD+ to increase the carbon sinks of Samoa

Project Consortium



- **Project design, coordination, communication, reporting**
- **Output 1**
  - ✓Establish working group in consultation with the NDE
- **Output 3**
  - ✓Analyze national strategies and opportunities to develop REDD+ implementation framework in Samoa
  - ✓Develop a framework for sustainable forest management of Samoa and consult with the stakeholders on the results
  - ✓Organize the workshops for policy actions

- **Output 2**
  - ✓Classify the forest and land cover by categories
  - ✓Assess map accuracy through field data collection
  - ✓Develop a methodology and model to estimate the amount of carbon sinks
  - ✓Conduct GIS/Remote Sensing Analysis on the primary and secondary earth observation data
  - ✓Meet the working group for validation etc.

Main Activities

Activity	Deliverables	Time Plan
Output 1: TA coordination mechanism established		
Activity 1.1: Map relevant stakeholders and establish a stakeholder working group	List of stakeholders (in consultation with the NDE)	During this visit
Activity 1.2: Organize consultative meetings with the working group	Minutes of the meetings with the stakeholders including the NDE	Throughout this project
Output 2: FOREST MAPPING AND CARBON SINKS POTENTIAL IN SAMOA		
Activity 2.1: Preliminarily analysis/survey of available gridded datasets and Climate data collection; (rainfall and temperature datasets)	Preliminary analysis/survey of available gridded datasets and Climate data collection	Already done
Activity 2.2: Classification of the forest and land cover by categories	Classification of the forest and land cover by categories	Sep. 2023
Activity 2.3: Meeting with the working group	Minute of the meeting with the working group to discuss the classification of the forest cover by categories	Feb. 2024
Activity 2.4: Assessment of map accuracy through field data collection at sites selected by stratified random sampling. (Identify trees, nature of the forest)	Assessment of map accuracy through field data collection at sites selected by stratified random sampling	During this visit

Main Activities

Activity	Deliverables	Time Plan
Output 2: FOREST MAPPING AND CARBON SINKS POTENTIAL IN SAMOA		
Activity 2.5: Meeting with the working group to discuss the model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest	Meeting with the working group to discuss the model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest	Feb. 2024
Activity 2.6: Definition of a methodology and creation of a model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest	Definition of a methodology and creation of a model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest	Dec. 2023
Activity 2.7: Presentation of the model in an in-person workshop of a day with the working group and future administrators and users of the model	Presentation of the model in an in-person workshop of a day with the working group and future administrators and users of the model.	During this visit
Activity 2.8: Testing of the model by the working group, and selected group of stakeholders (future users and administrators of the model)	Minute of the questions and bugs identified during the testing of the model by the working group, and selected group of stakeholders (future users and administrators of the model)	Dec. 2023
Activity 2.9: Guide for the use of the model	Guide for the use of the model	Dec.2024

Main Activities

	Deliverables	Time Plan
Output 3: REDD+ and carbon sinks potential in Samoa and develop a framework that would help Samoa in managing its forests sustainably and monitor any landscape changes		
Activity 3.1. Analyze national strategies and identify potential barriers or opportunities to develop REDD+ project in Samoa	Report on the opportunity to use the REDD+ to develop REDD+ carbon projects in Samoa	Dec. 2023
Activity 3.2. Define the framework´s vision and mission (1 or 2 days – open to all stakeholders)	Defined vision and mission of the framework	During this visit
Activity 3.3. Define the framework objectives through a workshop (2nd -3rd day for TA Steering Committee)	Report on the selected framework objectives as well as description of workshop held	Aug.-Sep. 2023
Activity 3.4: Define the Guiding principles through a workshop (4th and 5th day for TA Coordination team)	Report with the defined guiding principles as well as description of workshop held	Aug.-Sep. 2023
Activity 3.5: Formulate a draft of framework policy based on the inputs received during the 5-day workshops	Formulation of a Draft Framework for sustainable forest management in Samoa	Feb.2024
Activity 3.6: Share the draft of framework policy for comments and review from the Steering Committee	Revised Draft Framework based on working group´s comments	March.2024
Activity 3.7 Finalize the framework based on the comments received from the relevant stakeholders	Final framework	March.2024

Expected Outcomes

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Technical Outputs

- Time-series mapping of land-use and land cover
- Analysis of factors changing land-use
- Detail data with forest and land use in Samoa
- Model to estimate forest carbon in Samoa
- Technical support workshop and technical manuals
- Capacity building workshops for REDD+ implementation

Policy-related Outputs

- Policy alternatives to prevent deforestation and forest degradation
- Visions and missions of the 'Sustainable Forest Management Framework in Samoa' based on the survey of the Stakeholders
- Key policy actions for developing the Framework based on the survey and case studies of other countries
- Feedbacks from the stakeholders on the policy suggestions

Scope of the current Project

Current Position

- Diagnosis of the status quo
- Strategic planning of the REDD+ introduction steps
- Analysis of the forest reference level
- Suggestion of the forest monitoring system
- Identification of the future tasks

Actions of future projects

- Implementation of the National Strategies and Action Plans
- Establishment of the monitoring system for safeguards
- Benefit Distribution Mechanism

Steps for establishing the REDD+ policy framework of Samoa

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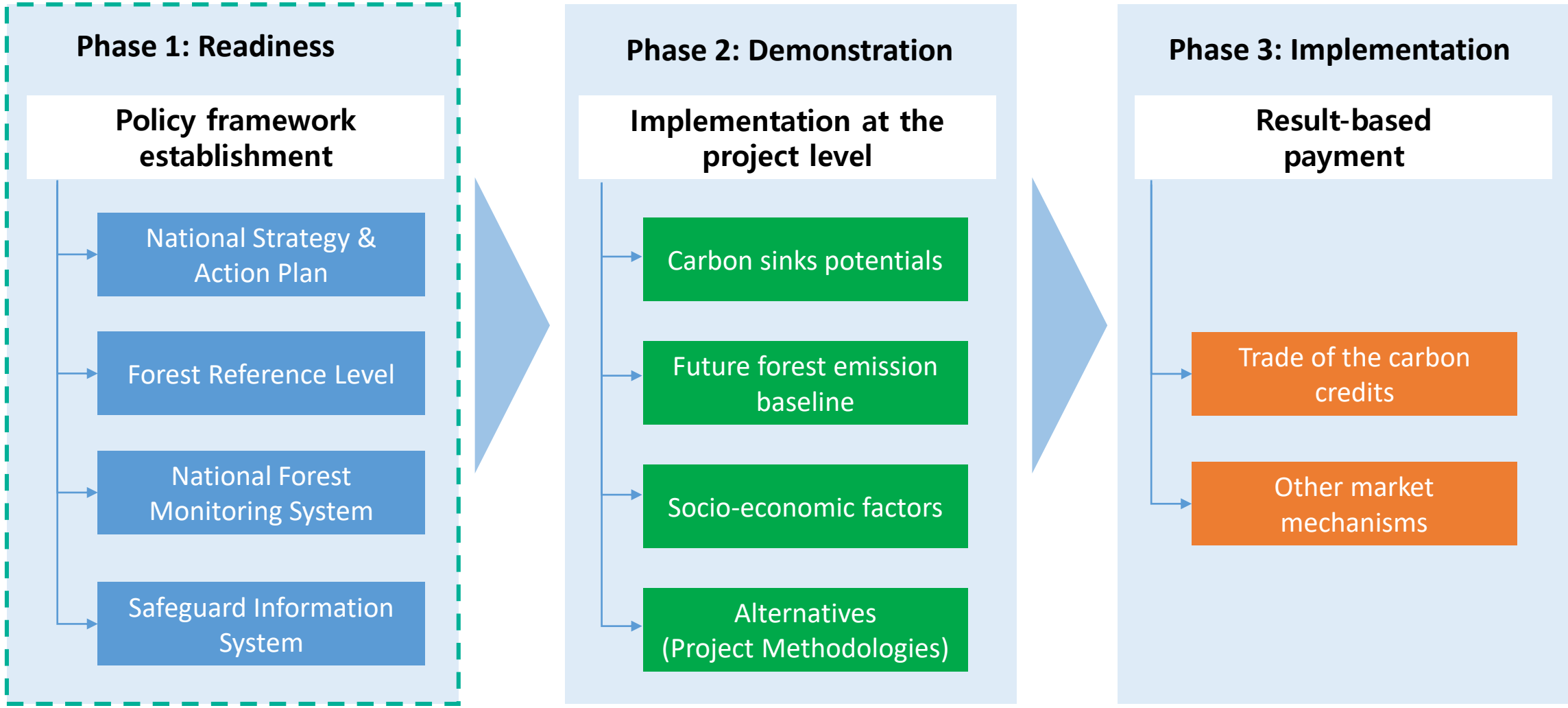
Levels of the Framework according to the 3 phases of the REDD+ implementation



Goal and objectives of the current TA project

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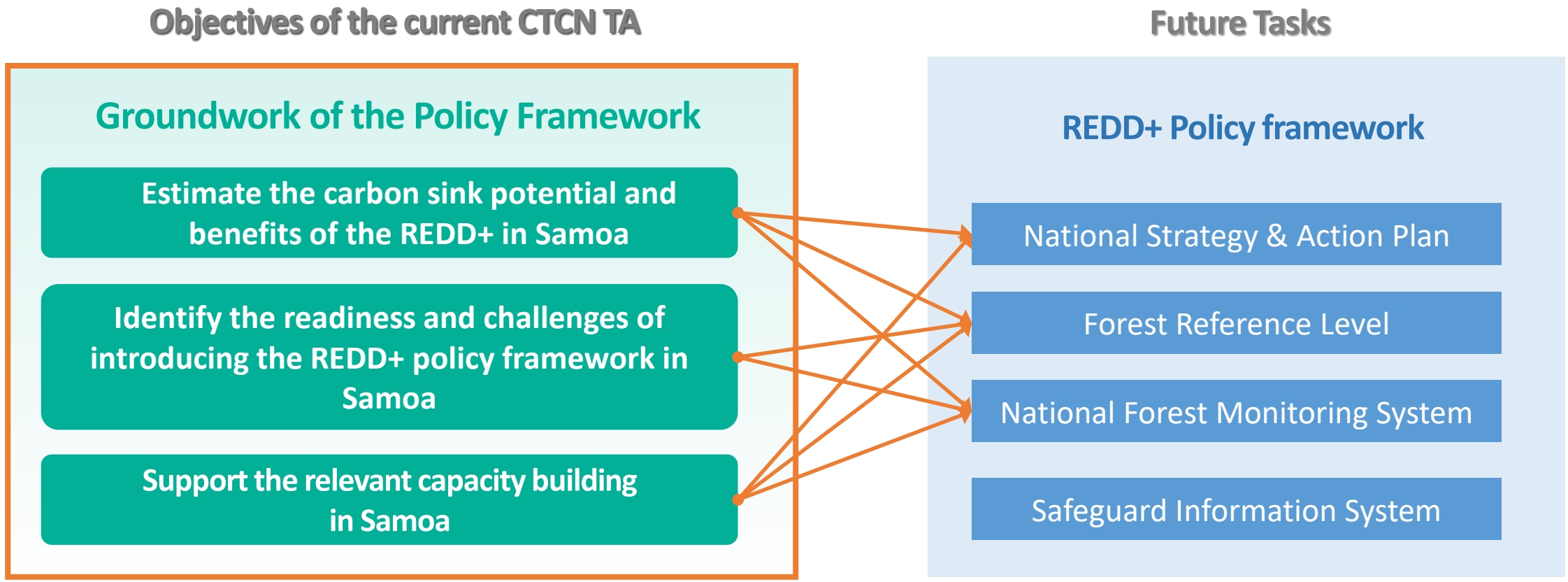
Goal Provide Technical Assistance to achieve the readiness of REDD+ (Phase 1)



Overview of the expert survey (1)

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Objective

- **To identify barriers and opportunities on REDD+ readiness and activities in Samoa**
- Provide an opportunity for Samoa to self-assess progress in REDD+ readiness in each of the components and subcomponents and identify gaps and additional needs
- Generate feedback and guidance for establishing REDD+ framework through multi-stakeholder self-assessment and assessment processes

Survey method and process

(1) Develop REDD+ assessment framework on readiness and urgency of the framework elements

(2) Conduct a survey of the experts (Steering committee + Stakeholder group)

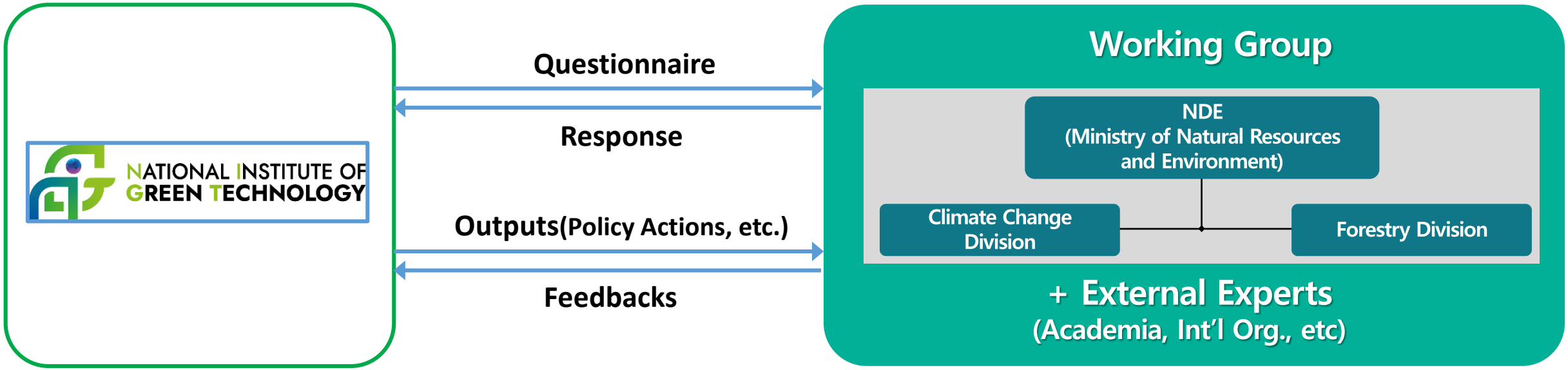
→ key respondents from governmental organizations, NGOs, universities

(3) Demonstrate Samoa's commitment to its readiness process and transparency

Role of the Working Group

Participation and Engagement of Key Stakeholders

Participatory and inclusive process



Overview of the expert survey (3)

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Assessment Questionnaire

- Divided by **4 components** → **8 sub-components** → **30 Indicators** with guiding questions
- Use a scale of 0 to 3 (following attributes)

0 = no evidence of Readiness consideration
1 = aware of it and being discussed
2 = agreed in principle (or some draft document and/or recommendations exist)
3 = established rules exist in law and/or are being implemented

Component		subcomponent		Indicator	Guiding question	Elements	Readiness	Urgency
1	Readiness organization and consultation	1a	National REDD+ management Arrangements	Operating mandate and budget	Is there evidence of the tasks of management bodies and budget planning for the			
				Multi-sector coordination mechanisms and corss-sector collaboration	Coordination responsibility agreeed?			
				Technical supervision capacity	Decision-making channels agreed?			
				Funds management capaci	investment requirements assessed?			
				Feedback mechanism				
		1b	Consultation, participation and outreach	Participatio of key stakeholders	Institutional reponsibilities/roles clarified?			
					Key relevant stakeholder involved?			
				Co	Procedure for stakeholder participation			
				Imp and public disclosure of const outcomes	political will and support exists?			
			Assessment of land use, land-use	Prioritization of direct and indirect drivers/barriers to forest carbon stock enhancement	REDD+ opportunity/trade-off analysis done?	rate of agricultural land (%)		
				Links between drivers/barriers and REDD+		urbanization (%)		
						rate of forest cover (%)		
						Increase rate of forest fire		
						Rate of illegal logging (%)		

Example (draft)

Final result of the Output 3

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Methodology: literature review, case study, stakeholder survey and dialogue (incl. NDE), etc.

Identification of the REDD+ readiness and key policy actions (tentative)

Elements	REDD+ framework		REDD+ for Samoa			
	Key considerations	Cases	Readiness	Relevant data and information	Key stakeholders	Key actions
National Strategy (NS) or Action Plan (AP)						
Forest Reference (Emission) Level (FR(E)L)						
National Forest Monitoring System (NFMS)						
Safeguard Information System (SIS)						

Example (draft)