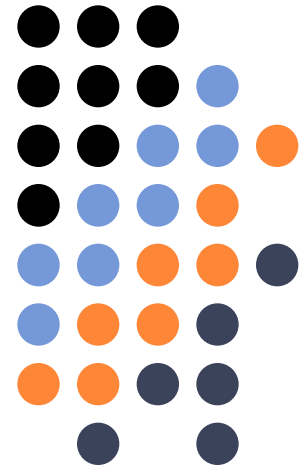# Afforestation Reforestation

Seminar on Business Opportunities of Climate Change Mitigation in Sri Lanka Towards Post-Kyoto Era

21st July 2011

JICA Expert Team

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Objectives of the Seminar

- To gain basic understanding of A/R CDM
- To understand the major issues regarding A/R CDM projects
- To understand the basic concept of the carbon sink calculation and A/R CDM CER
- To know that there are new approaches to forestry carbon credit projects

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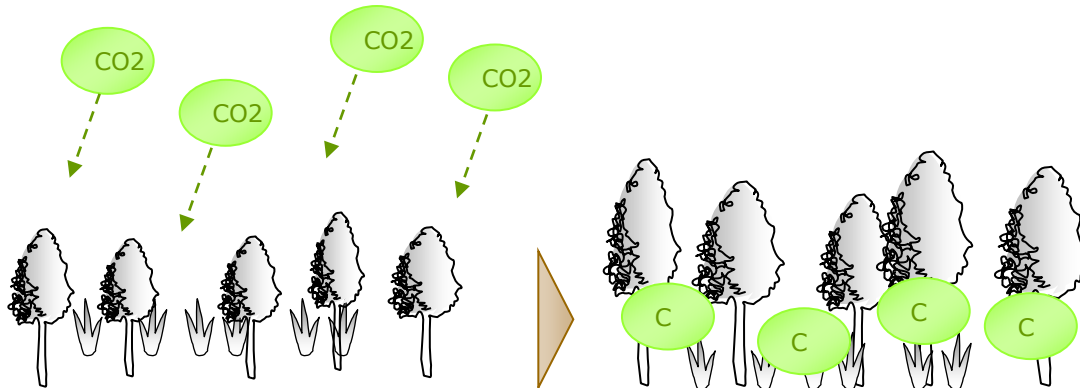5. ## New Approach
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   - Countries which may benefit from REDD projects
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1. Basics
What are A/R projects?

- A/R→Afforestation Reforestation
- CO_2 is absorbed by the trees
- Trees fix the carbon during its growth, thus prevent emission of CO_2 to the atmosphere.
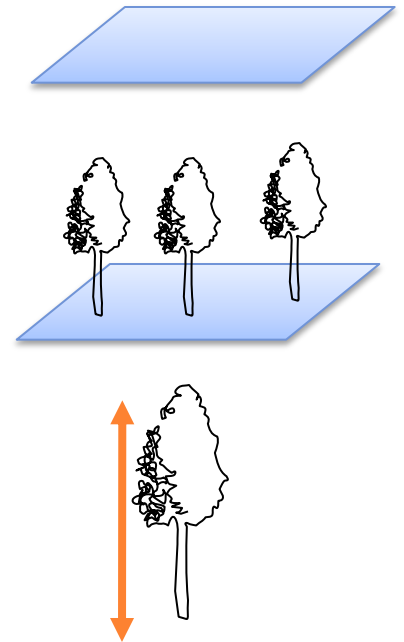
1. Basics
What are Forests?

UNFCCC Forest Definition:

Minimum land area: 0.05~1ha

Minimum tree canopy coverage: 10~30%

Minimum tree height: 2~5 meters

Sri Lankan Forest Definition

Minimum land area: 0.05ha

Minimum tree canopy coverage: 20%

Minimum tree height: 3m

Small patch of land would qualify as forest, but shrubs will not qualify as forest

Is this a forest?

The tree height needs to be over 3m to qualify as forest.

Is this a forest?

It is a forest as long as it meets the forest definition

Whether it qualifies as a A/R CDM project, will depend on whether the project meets A/R CDM requirements.

1. Basics
A/R definitions

- **Reforestation (CDM definition)**

  is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. <u>For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989</u>.

- **Afforestation (CDM definition)**

  is the direct human-induced <u>conversion of land that has not been forested for a period of at least 50 years to forested land</u> through planting, seeding and/or the human-induced promotion of natural seed sources.
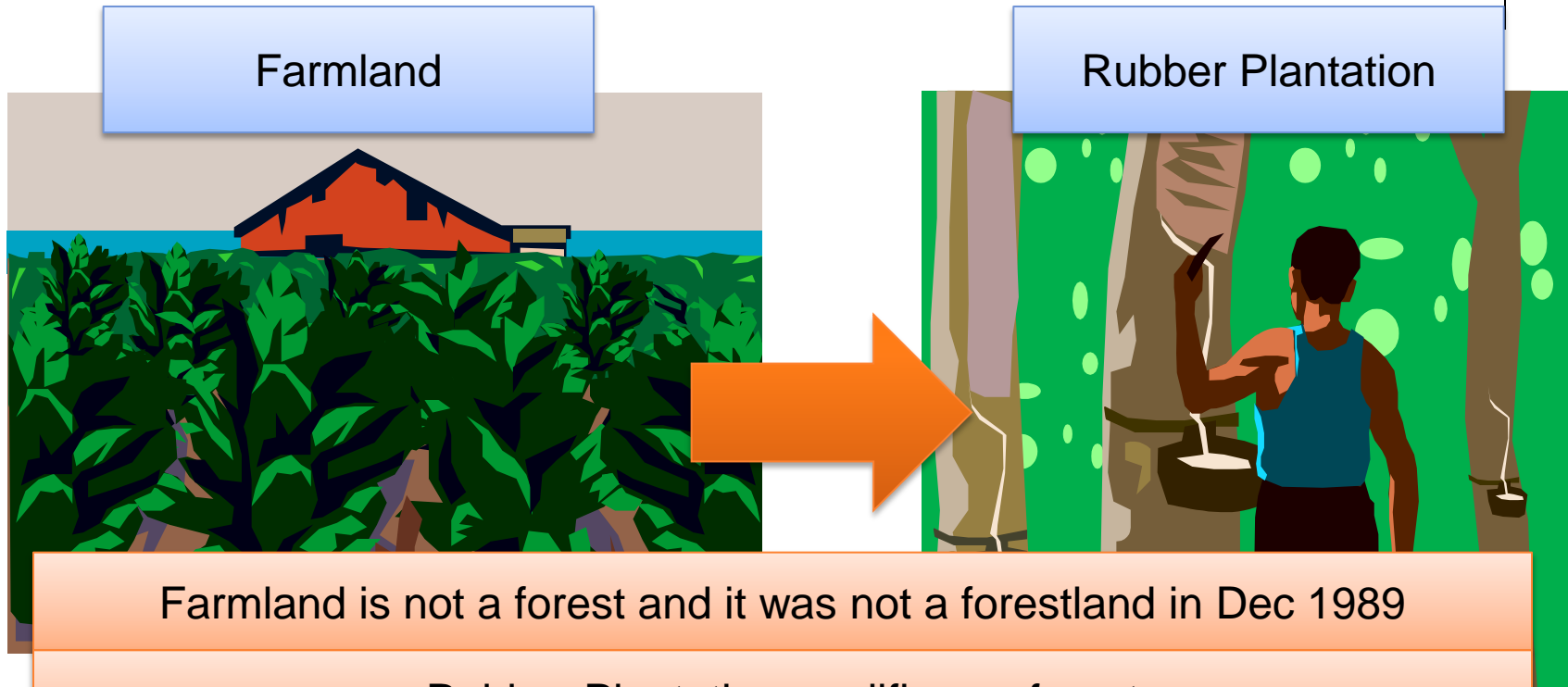
1. Basics
A/R CDM Additionality

A/R CDM projects must be "additional" like any other CDM projects.

"Additional" means that the A/R project would not have realized with out it being A/R CDM.
(i.e. The project would not have been realized without the carbon revenue and/or technical assistance from the Annex I nation)

Does this project qualify as a A/R CDM project?

Farmland

Rubber Plantation

Farmland is not a forest and it was not a forestland in Dec 1989

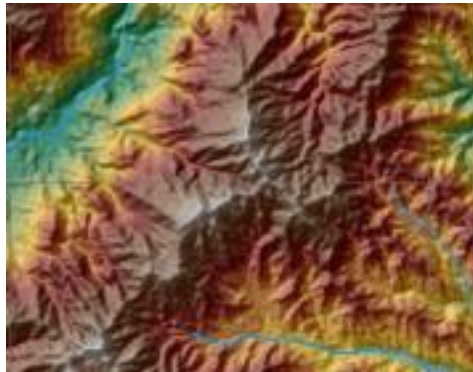Rubber Plantation qualifies as forest

It is a human induced activity

Rubber Plantation is additional (e.g. it is not economically feasibility to convert the farmland to rubber plantation with out A/R CDM credit revenue
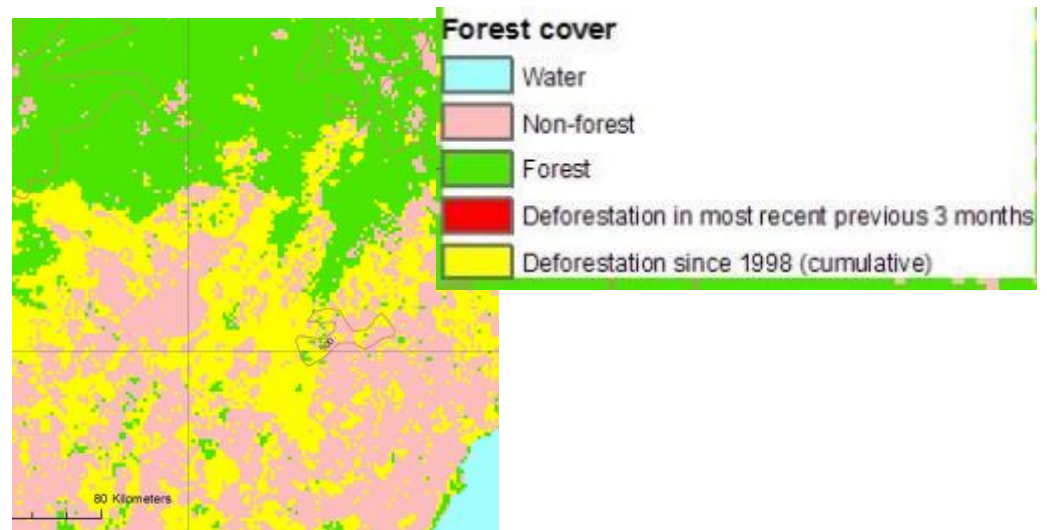
2. Terminologies
Remote Sensing Technology

Remote Sensing involves acquisition of the land surface data using aerial sensor technologies, such as aerial surveillance and satellite imaging.
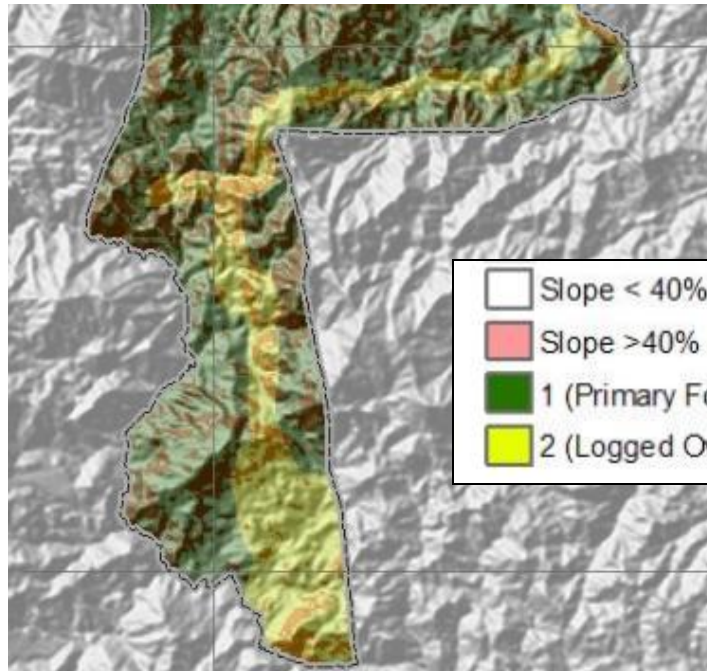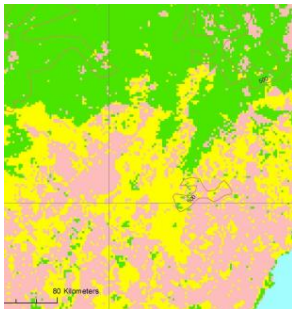

Terrain information

Forest Cover Information

Forest cover

- Water
- Non-forest
- Forest
- Deforestation in most recent previous 3 months
- Deforestation since 1998 (cumulative)

80 Kilometers
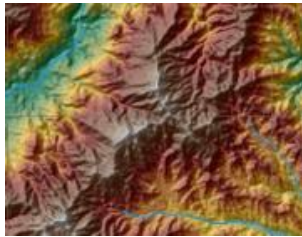
2. Terminologies
Geographic Information System

Geographic Information System (GIS) is an information technology system which manages data in reference to geographic location data.

Terrain and forest cover information combined

Slope < 40%
Slope >40%
1 (Primary Forest - Very Good Condition)
2 (Logged Over Forest - Good Condition)

2. Terminologies Stratification

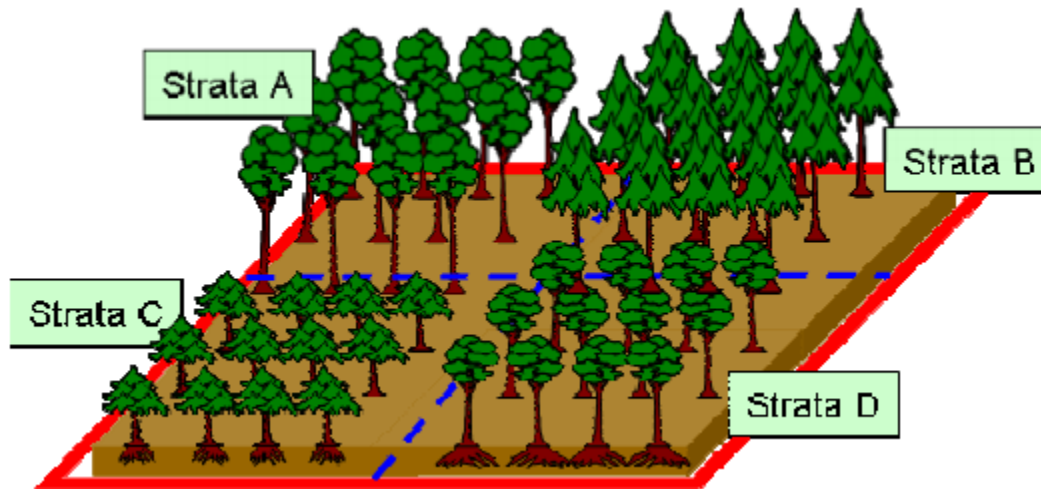- Project sites are divided into strata.
- Each strata is in homogenous condition
- Sampling needs to be conducted at each strata.

Factors which affects carbon stock change:
- ☐ Soil
- ☐ Climate
- ☐ Slope
- ☐ Previous land use
- ☐ Project plan
  - ➢ Tree species
  - ➢ Timing of planting & harvesting

Strata A
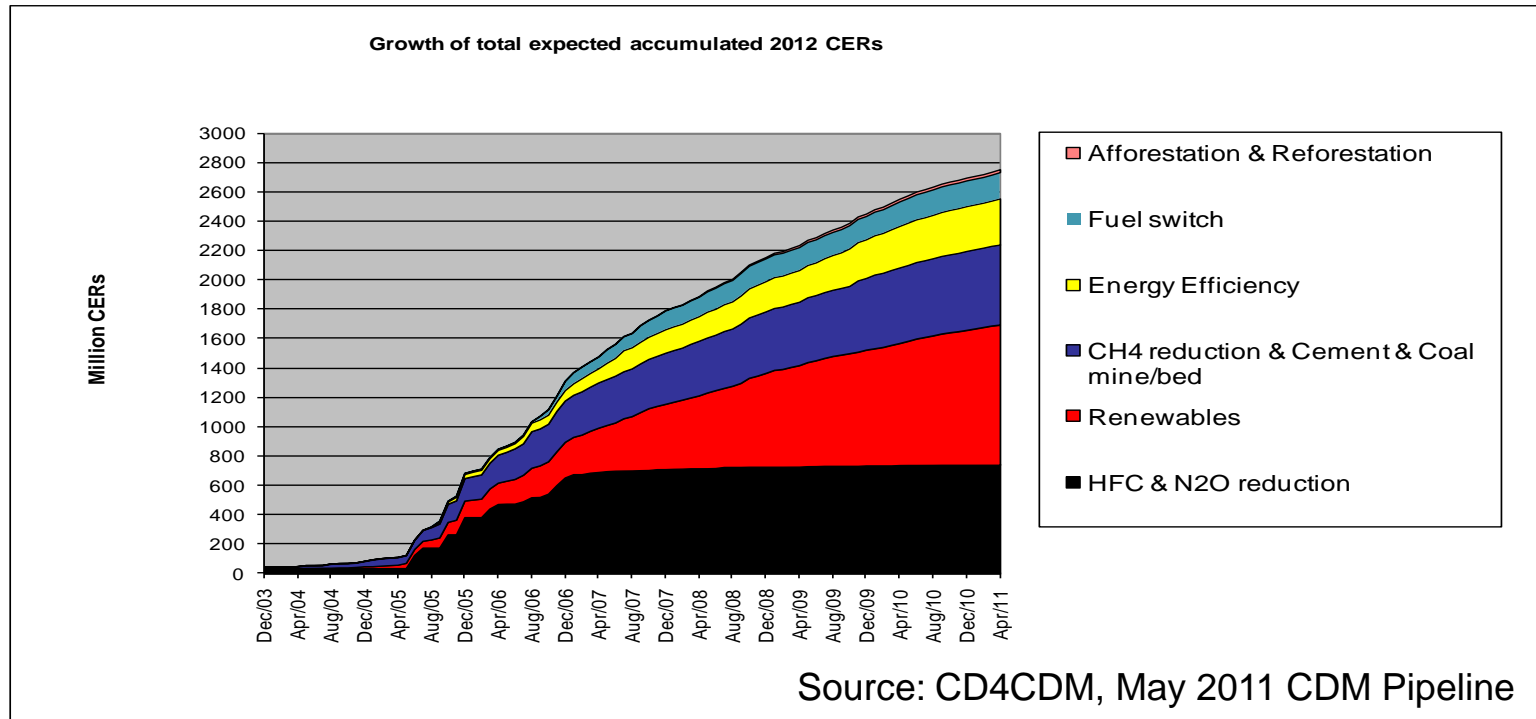
Strata B

Strata C

Strata D

Source: JICA (2008) Guidebook for Small Scale AR CDM activities

3. A/R Issues
CDM Statistics

- As of May 2011, there are 3034 registered projects.
- Of which <u>21 projects are registered A/R projects</u>.
- That is 0.7% of the total registered projects.

Growth of total expected accumulated 2012 CERs

Legend:
- Afforestation & Reforestation
- Fuel switch
- Energy Efficiency
- CH4 reduction & Cement & Coal mine/bed
- Renewables
- HFC & N2O reduction
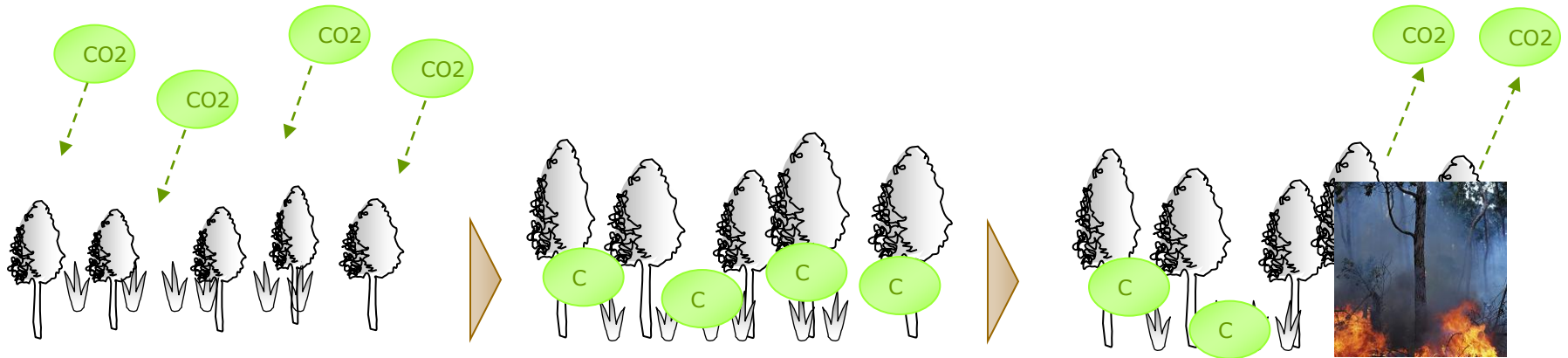
Source: CD4CDM, May 2011 CDM Pipeline

There are two major issues regarding A/R CDM…

3. A/R Issues
Issue1: Non-Permanence

- Trees stocks carbon (thus it is a carbon sink).
- Once the tree is combusted or rotten, CO_2 and methane are released to the atmosphere.

Carbon credit generated from A/R CDM activities are different from the other CDM projects. **They are time limited credits.**

l-CER: expires at the end of the crediting period (end of project)

t-CER: expires during every commitment period (end of Kyoto Protocol)

3. A/R Issues
Issue2: Monitoring

Monitoring of forestry activity involves covering vast area of land, from 1,000 ha to even 10,000ha.
It involves field survey (per strata) and that requires significant manpower.
Therefore monitoring activity is often carried out every 5 years, in which case carbon credit could only be issued every 5 yeas.

Example of Monitoring Parameters for Hydro Power Project:

- Supply of electricity to the grid
- Flow rate of the water
- CO_2 emission factor of the grid
- Inhouse electricity consumption
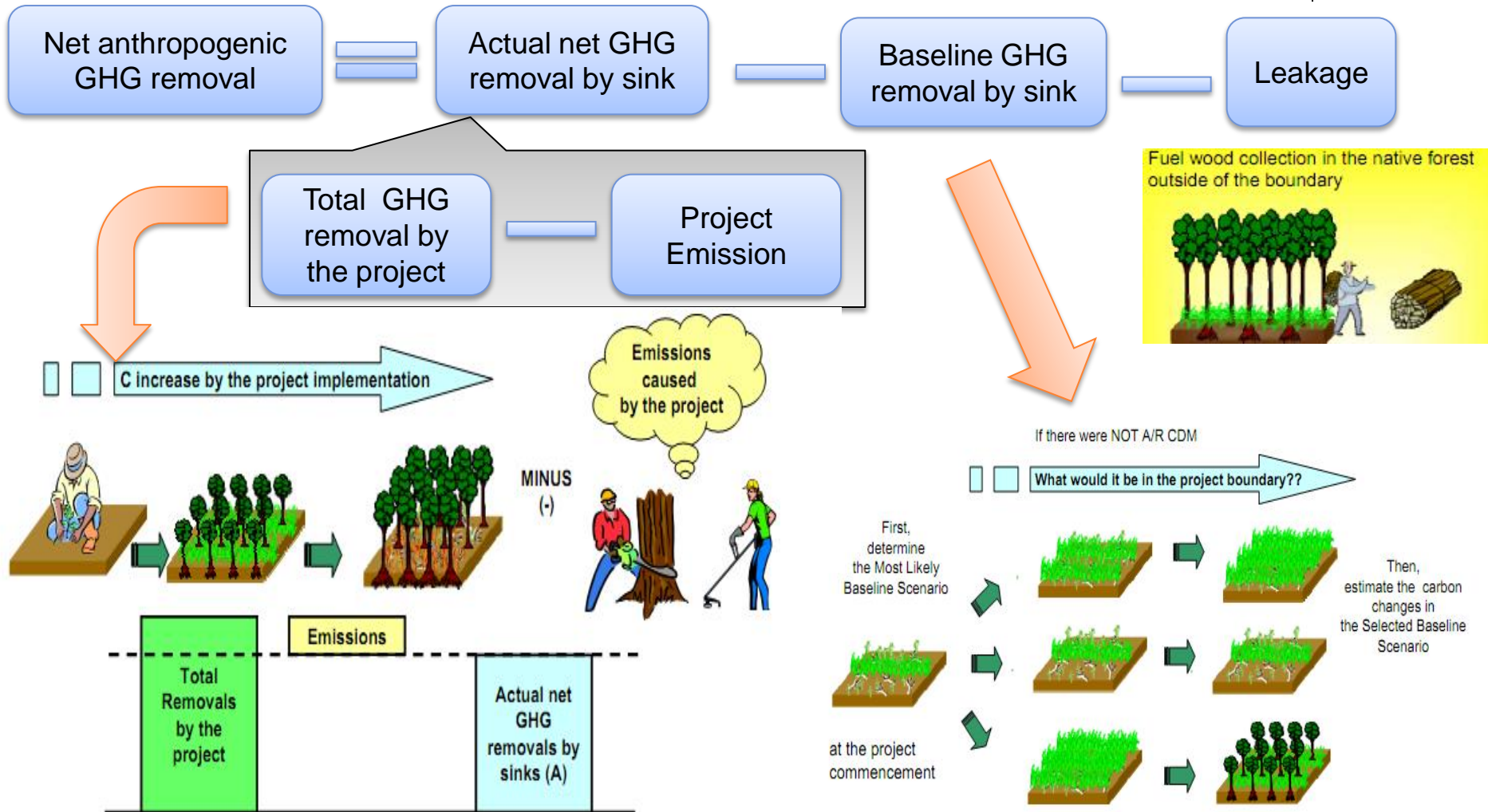
Specific monitoring points

Example of Monitoring Parameters for AR CDM project:

- Fossil fuel use at the site (chainsaw/ tractors)
- Burning of biomass
- Nitrogen Fertilization
- Tree diameter sampling

AR CDM needs to cover vast area

4. A/R CDM Concepts
Carbon Sink Calculation

Net anthropogenic GHG removal = Actual net GHG removal by sink − Baseline GHG removal by sink − Leakage

Actual net GHG removal by sink = Total GHG removal by the project − Project Emission

Fuel wood collection in the native forest outside of the boundary

C increase by the project implementation

Emissions caused by the project

MINUS (-)

Total Removals by the project

Emissions

Actual net GHG removals by sinks (A)

If there were NOT A/R CDM

What would it be in the project boundary??

First, determine the Most Likely Baseline Scenario

at the project commencement

Then, estimate the carbon changes in the Selected Baseline Scenario

Source: JICA (2008) Guidebook for Small Scale AR CDM activities
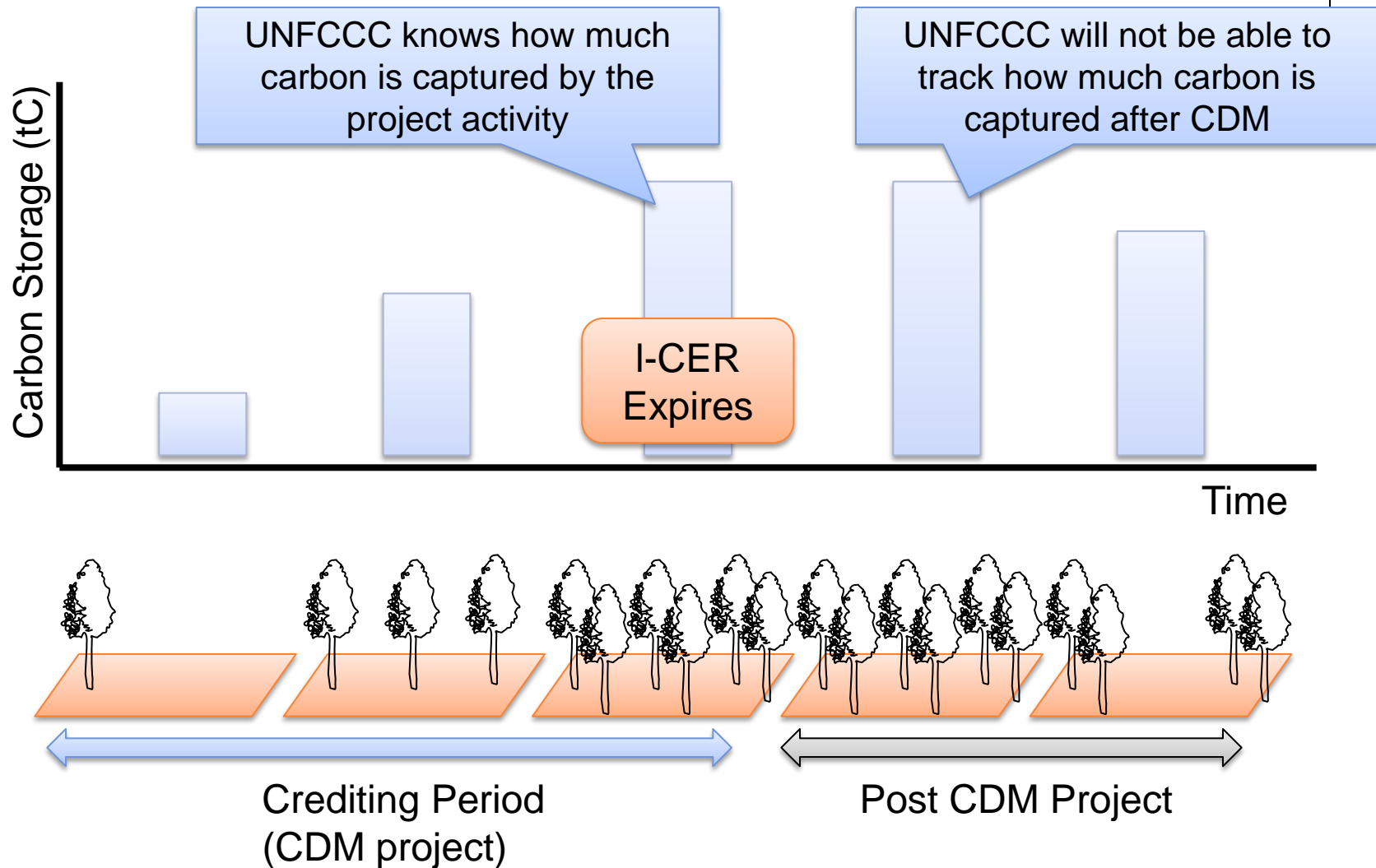
4. A/R CDM Concepts
A/R CDM CER

Due to the non-permanent nature of A/R CDM projects, the sequestered carbon may be released into the atmosphere during and after the CDM project activity. UNFCCC could monitor such activities only during the project period.

Unlike the conventional CERs, A/R CDM CERs (l-CER and t-CER) expires once the A/R CDM project ends.

- Long term CER (l-CER): Expires at the end of the crediting period (end of project)
- Temporary CER (t-CER) expires during every commitment period (end of Kyoto Protocol)
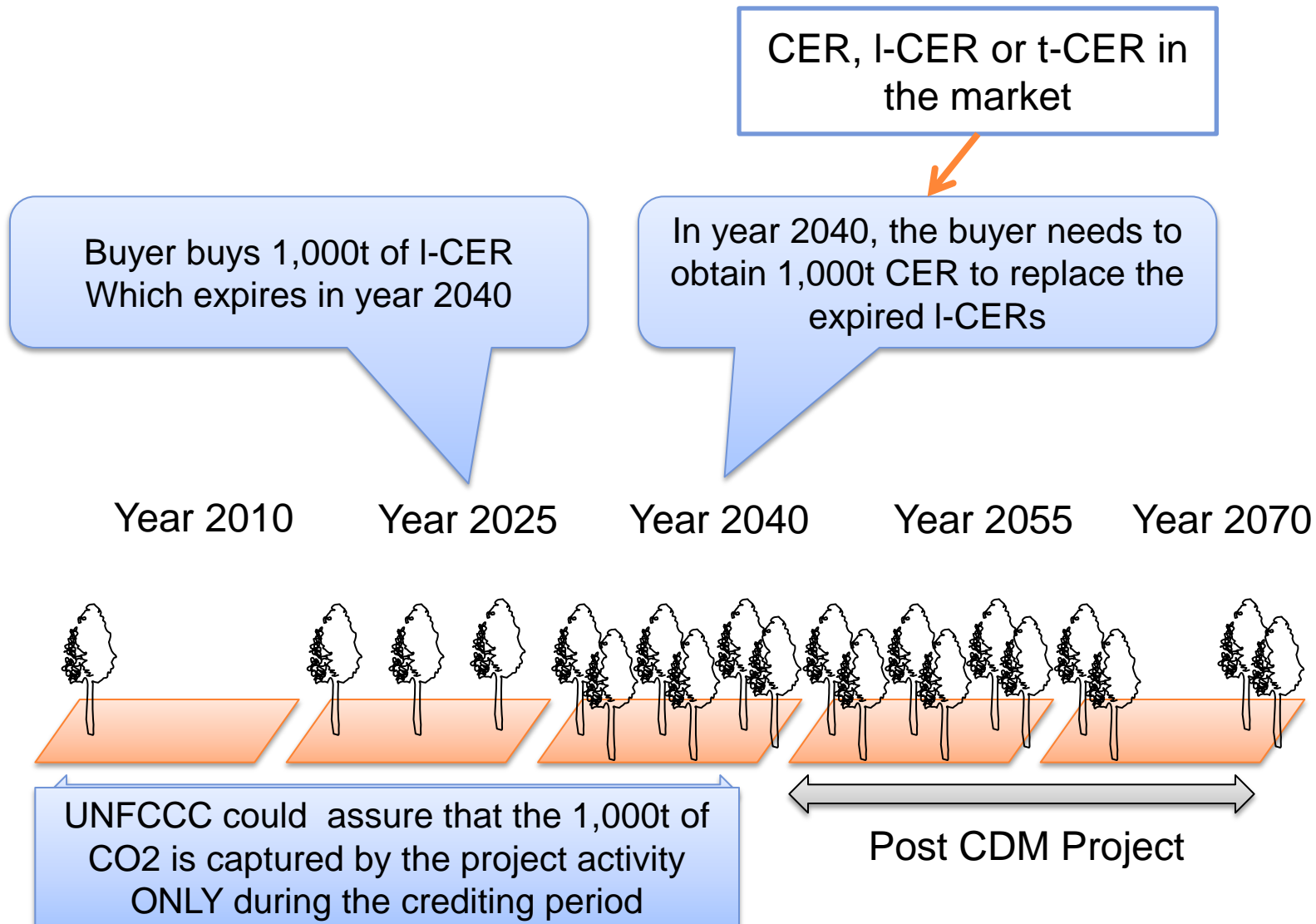
4. A/R CDM Concepts
I-CER in Detail

UNFCCC knows how much carbon is captured by the project activity

UNFCCC will not be able to track how much carbon is captured after CDM

Carbon Storage (tC)

I-CER Expires

Time

Crediting Period (CDM project)

Post CDM Project

4. A/R CDM Concepts
l-CER in Detail: Buyers Perspective

CER, l-CER or t-CER in the market

Buyer buys 1,000t of l-CER Which expires in year 2040

In year 2040, the buyer needs to obtain 1,000t CER to replace the expired l-CERs

Year 2010   Year 2025   Year 2040   Year 2055   Year 2070

UNFCCC could assure that the 1,000t of CO_2 is captured by the project activity ONLY during the crediting period
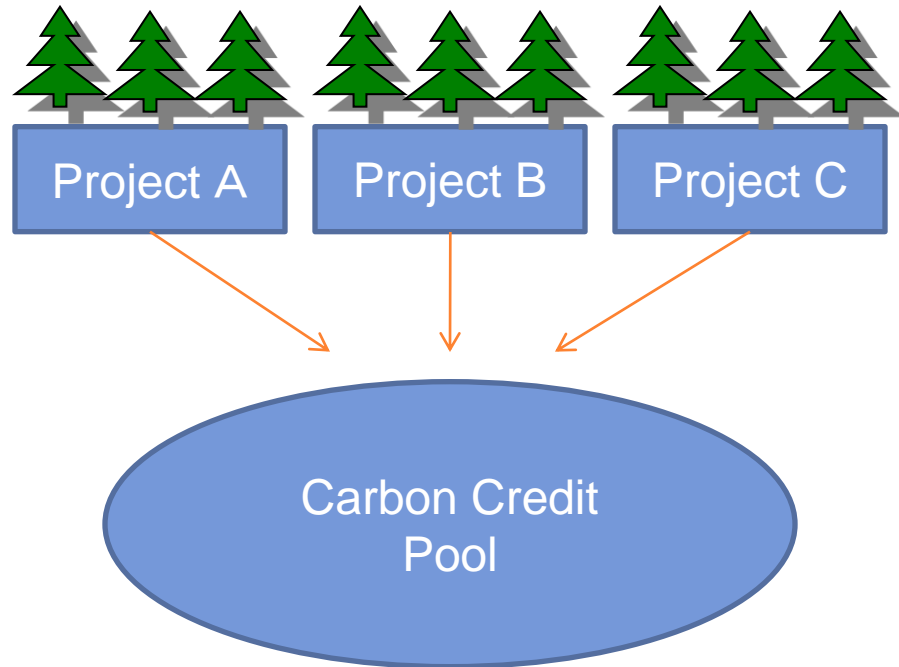
Post CDM Project

4. A/R CDM Concepts
t-CER

→l-CER expires during the end of the crediting period (end of CDM)

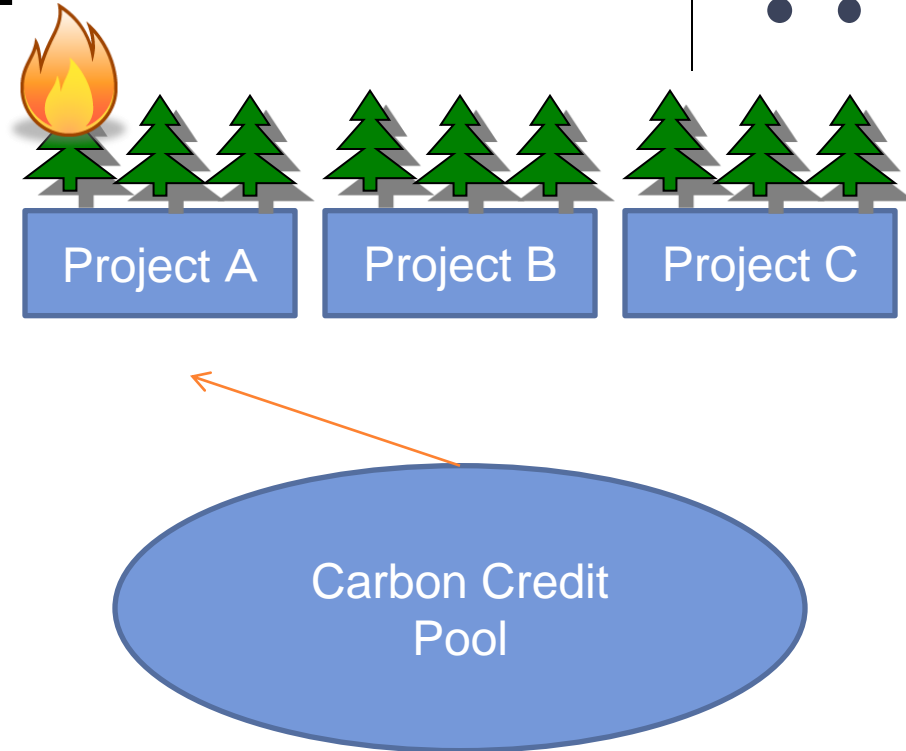→t-CER will expire during the end of the commitment period
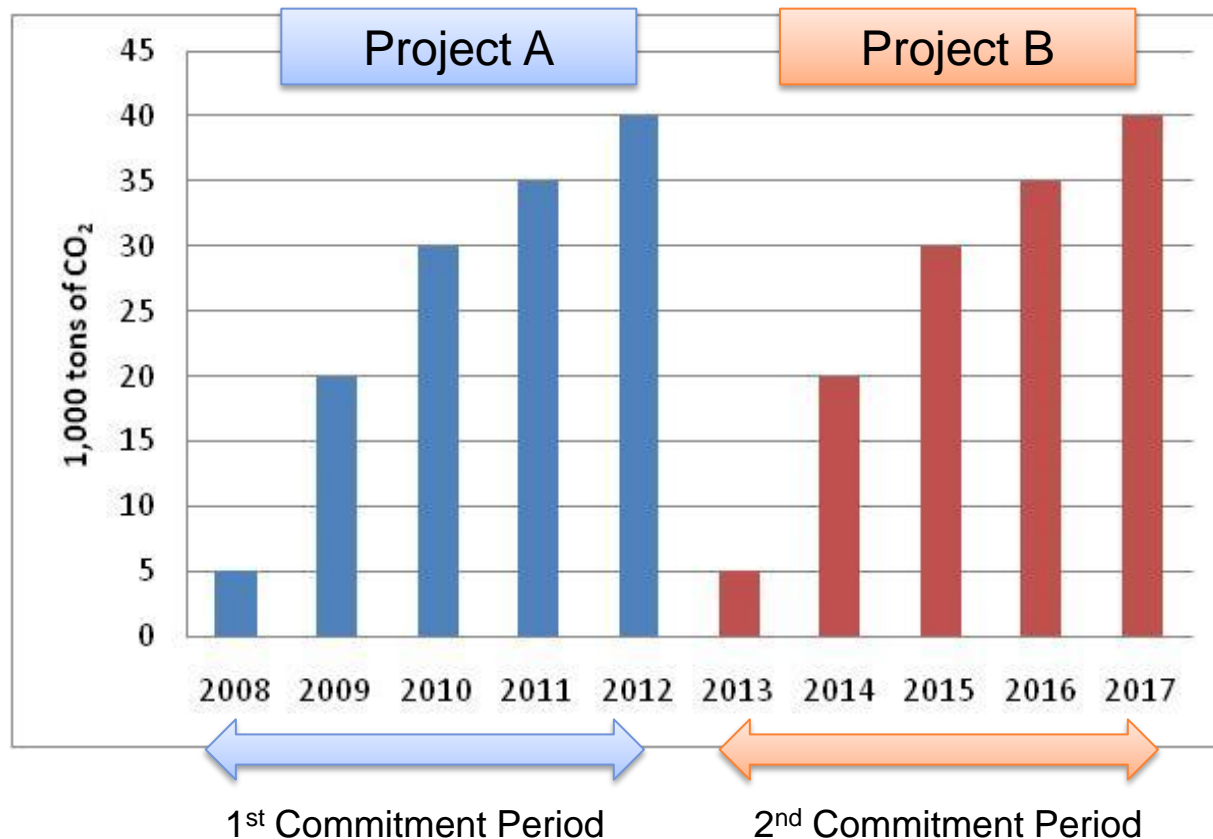
t-CER is effective only during the single commitment period

5. New Approach
Credit pooling approach

Project A   Project B   Project C   Project A   Project B   Project C

Carbon Credit Pool   Carbon Credit Pool

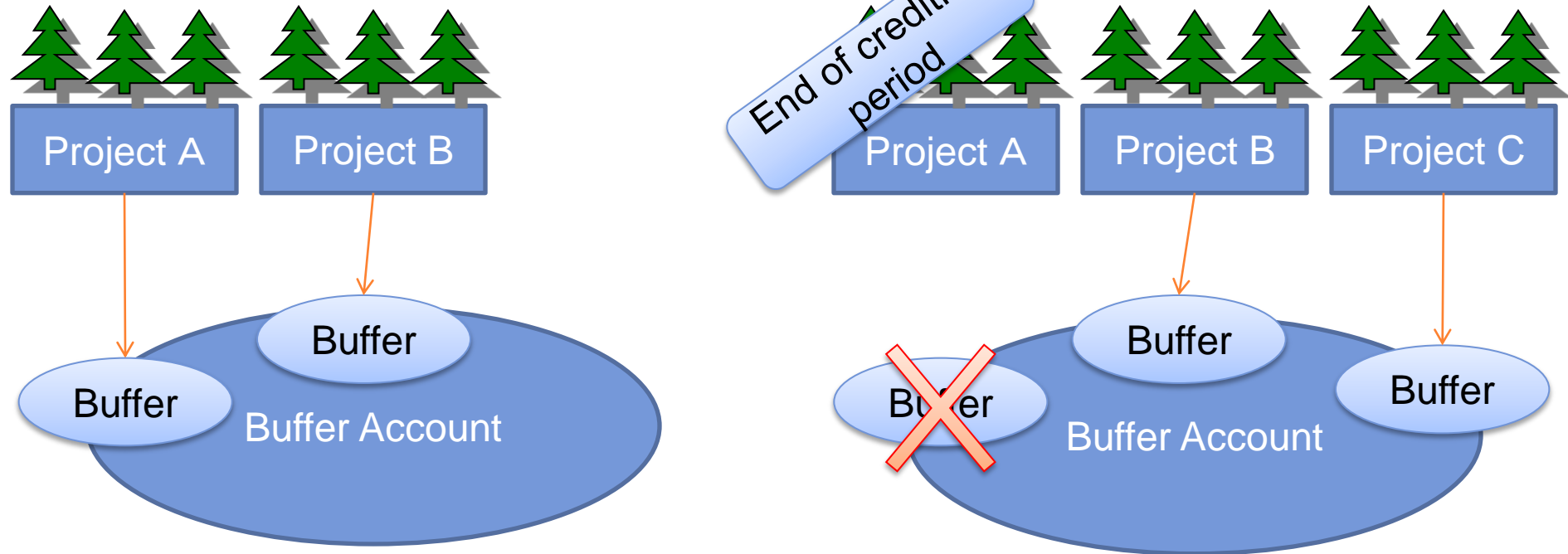Portion of the carbon credit from each projects are pooled to a specific fund

If the CO_2 is emitted from one of the project the carbon credit from the pool could be utilized to offset the loss

As long as the carbon credit pool is managed correctly, the carbon credit from these projects, could be treated as "permanent ".

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5. New Approach
Credit pooling approach: VCS

Voluntary Carbon Standard use the Credit Pooling Approach:
"The VCS will periodically review the minimum buffer values to ensure that a positive and safe balance of buffer credits is held in the VCS registry at all times" (VCS Guidance for Agriculture, Forestry and Other Land Use Projects)
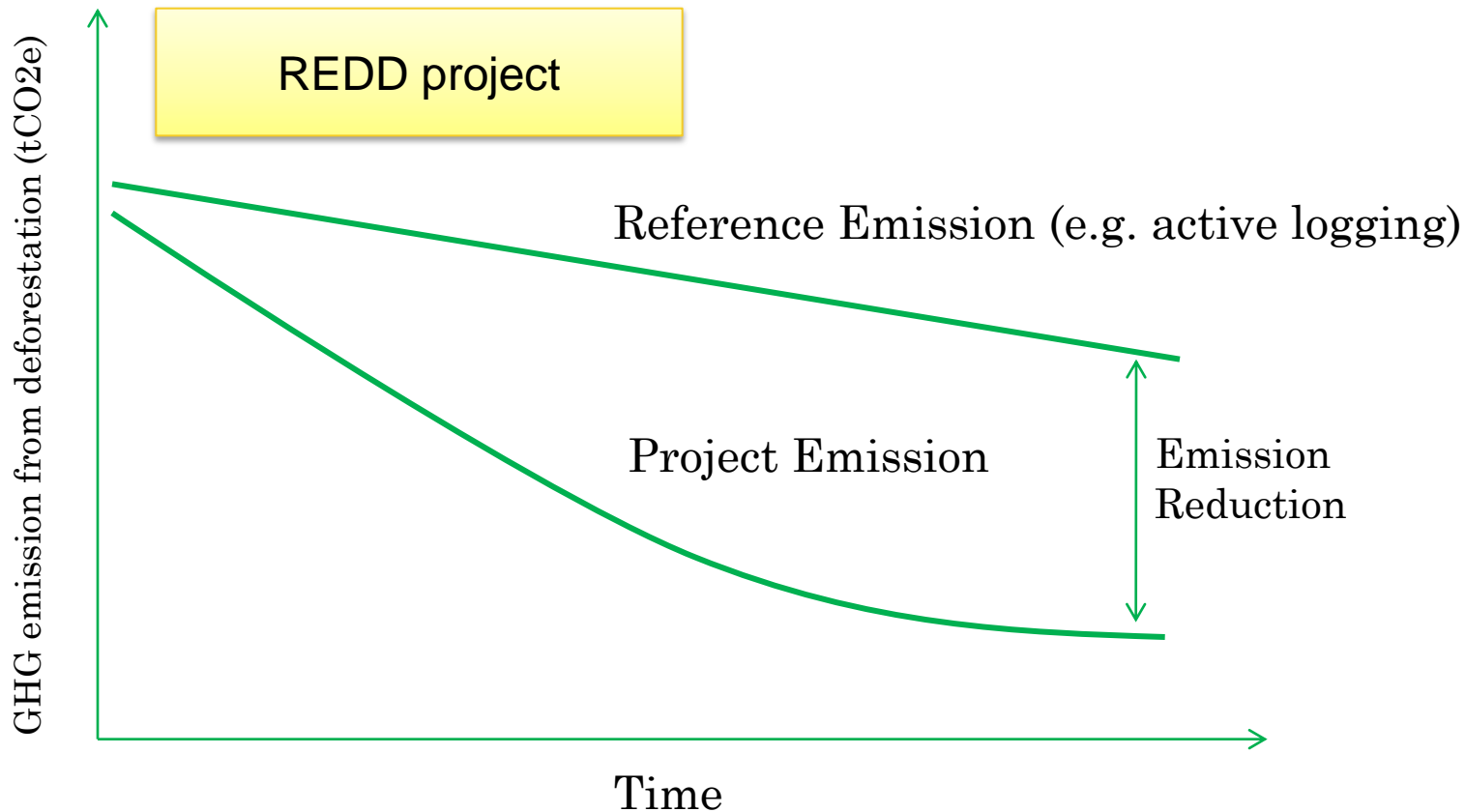→**As long as there is a continuous flow of new projects the buffer account is maintained**
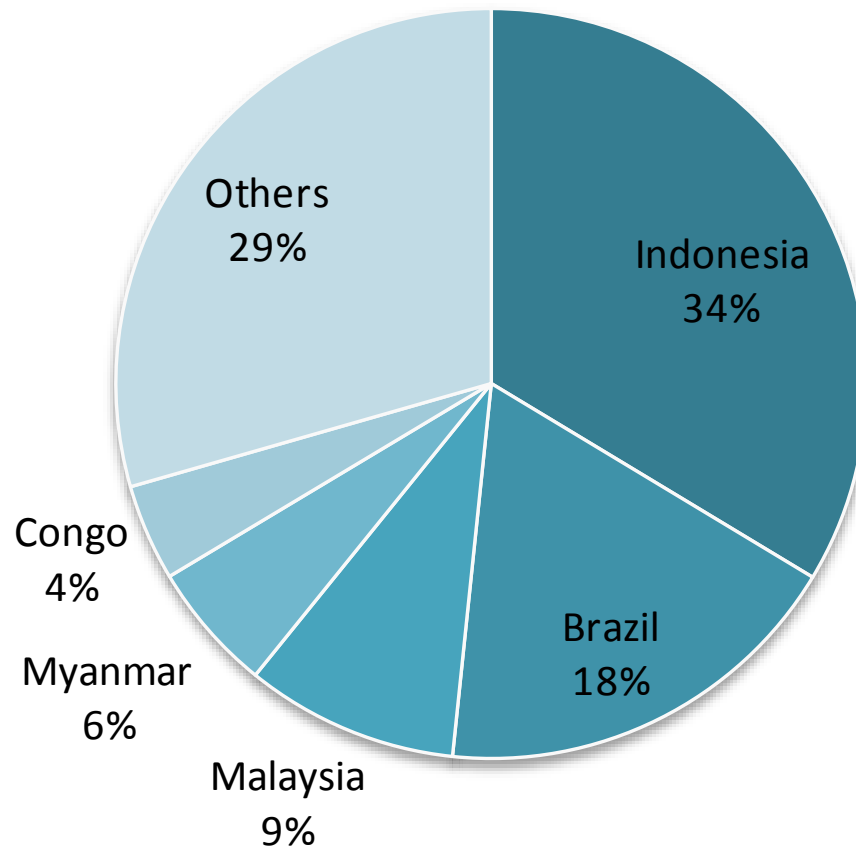
5. New Approach REDD

REDD:
Reducing Emissions from Deforestation and forest Degradation

5. New Approach
Countries which may benefit from REDD projects

Pie chart:
- Indonesia 34%
- Brazil 18%
- Malaysia 9%
- Myanmar 6%
- Congo 4%
- Others 29%

IPCC Report states that emissions from deforestation accounts for 20% of global GHG emissions.
WRI, US based research organization, highlights that in year 2000, 34% of the GHG emission from Land Use and Land Use Change and Forestry (LULUCF) resulted from Indonesia followed by Brazil (18%) .

5. New Approach
REDD, REDD+ and REDD++

Avoiding deforestation in one part of the land may cause increase in timber harvesting activities in another part of the land.
By providing timber from a sustainably managed REDD+ site, it ensures sufficient quantity of timber will be supplied to the market.

REDD, REDD+ and REDD++ categorisation

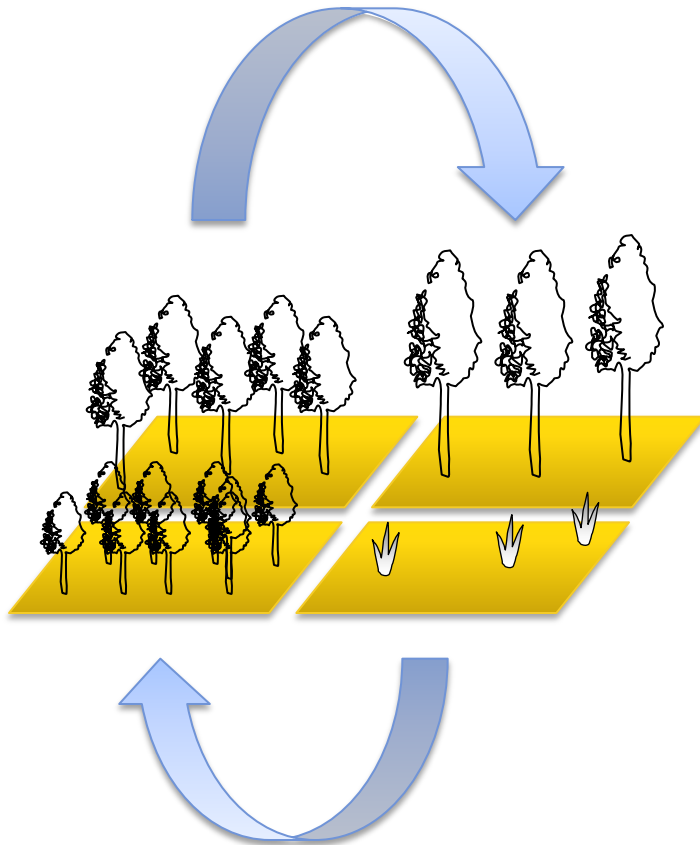|		
REDD	DD	Deforestation
		Forest Degradation
REDD+	+	Reforestation
		Sustainable Forest Management
REDD++	Another+	Management of the buffer zones (social aspec)

5. New Approach
Potential projects in Sri Lanka

- REDD+ and REDD++
- Sustainable forest management
- A/R projects may be beneficial, if it has significant social and/or environmental benefits such as watershed conservation and agroforestry.
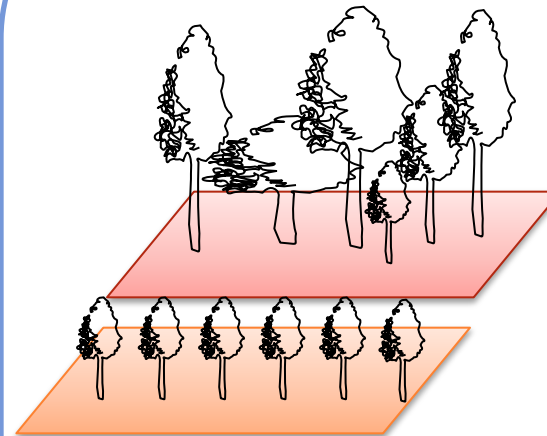
Sustainable Forest management and REDD+ projects

Watershed Conservation Program

REDD
Conservation of the existing forest

+

Replanting of the degraded land

**Rotational Cropping
Low impact logging etc.**