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AgroParisTech
INSTITUT DES SCIENCES ET INDUSTRIES DU VIVANT ET DE L'ENVIRONNEMENT
PARIS INSTITUTE OF TECHNOLOGY FOR LIFE, FOOD AND ENVIRONMENTAL SCIENCES

TROPICAL FORESTS AND CLIMATE CHANGE: FROM FACTS TO ECOPOLITICS

IMPLEMENTATION OF A FORESTY PROJECT FOR CLIMATE CHANGE MITIGATION

I. THEORY

Joint FNS-GAIA post-master module
« Tropical forests and climate change »

Montpellier, February 15-16, 2018

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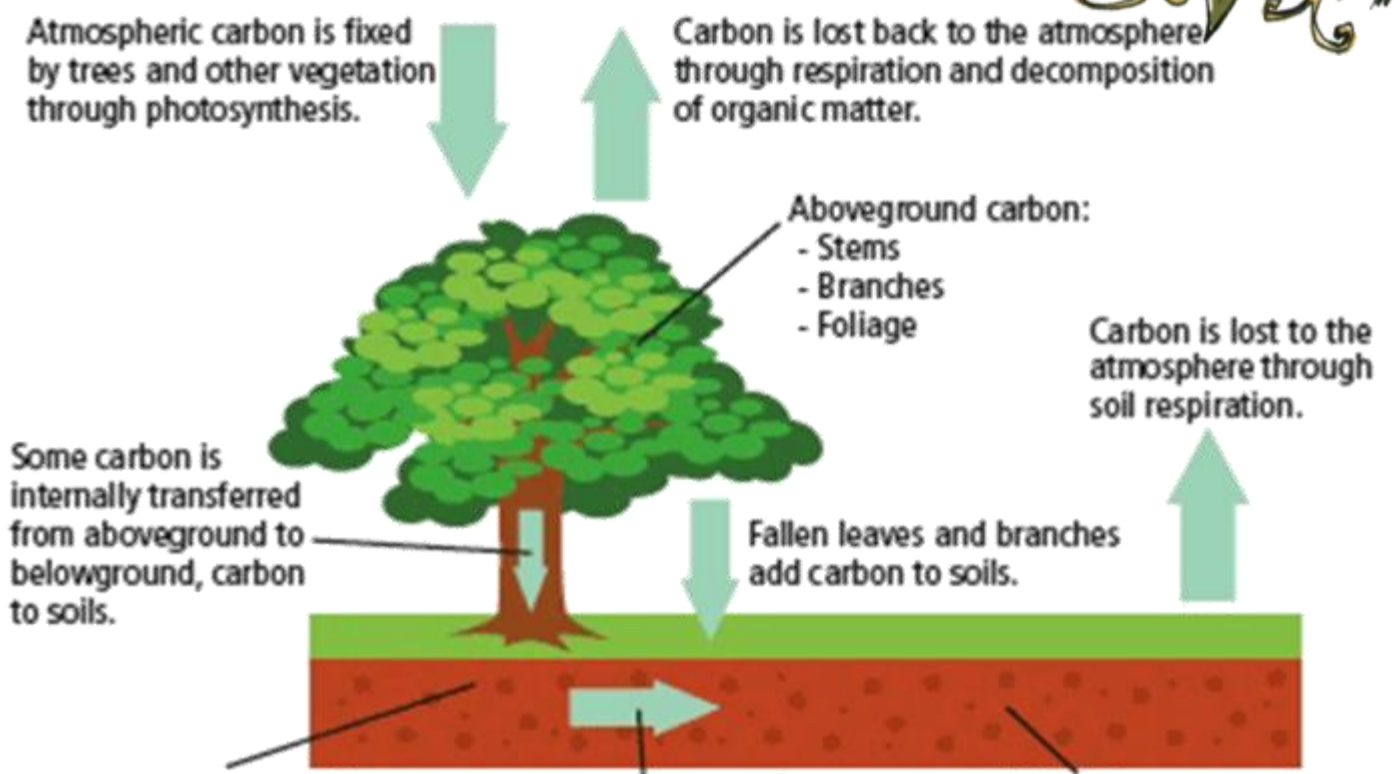
Forest carbon cycle



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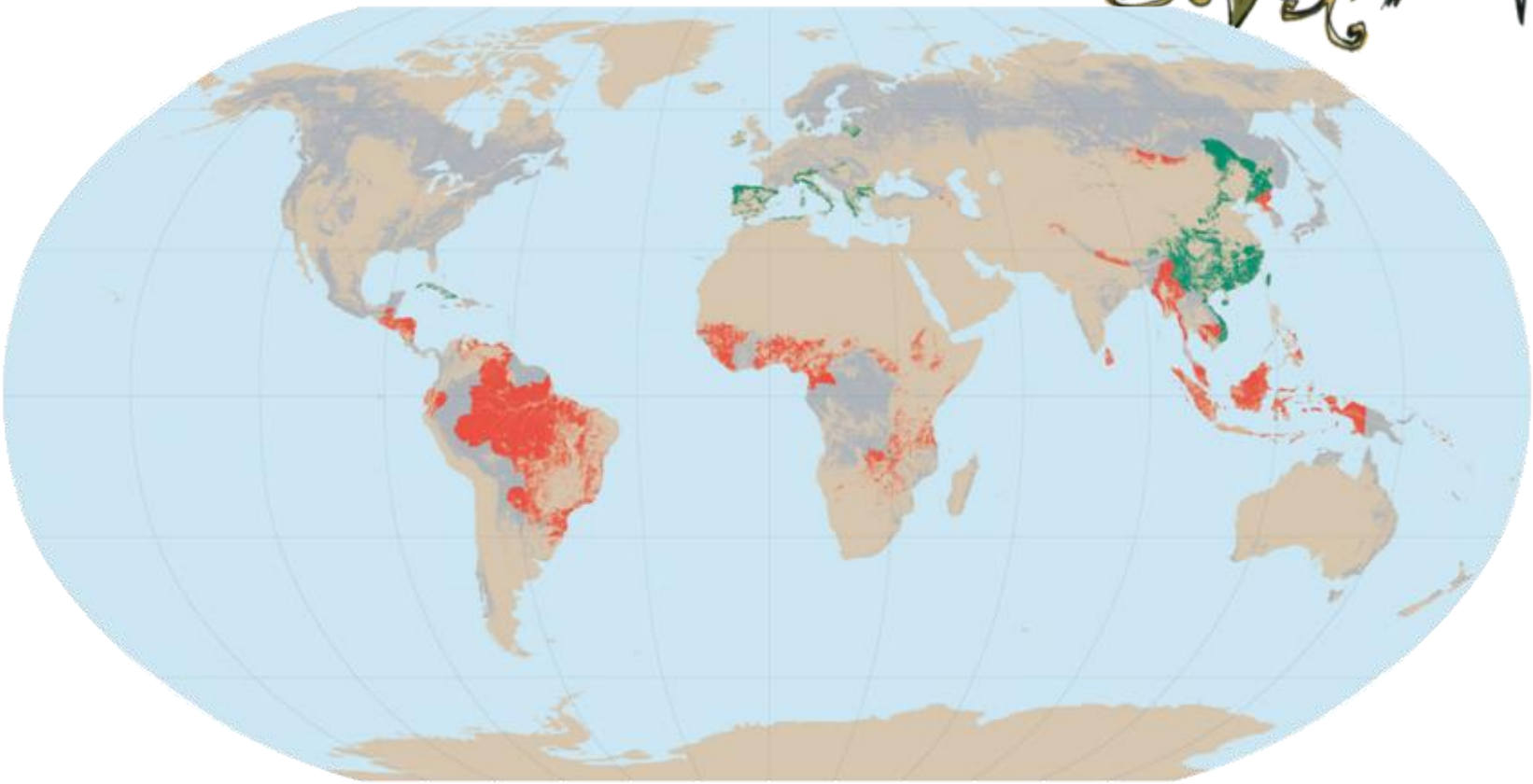
Source : US Environmental Protection Agency

Changes in forest area (1/2)

Countries with large net changes in forest area 2000–2005



>0.50% decrease per year
>0.50% increase per year
Change rate between -0.50 and 0.50% per year

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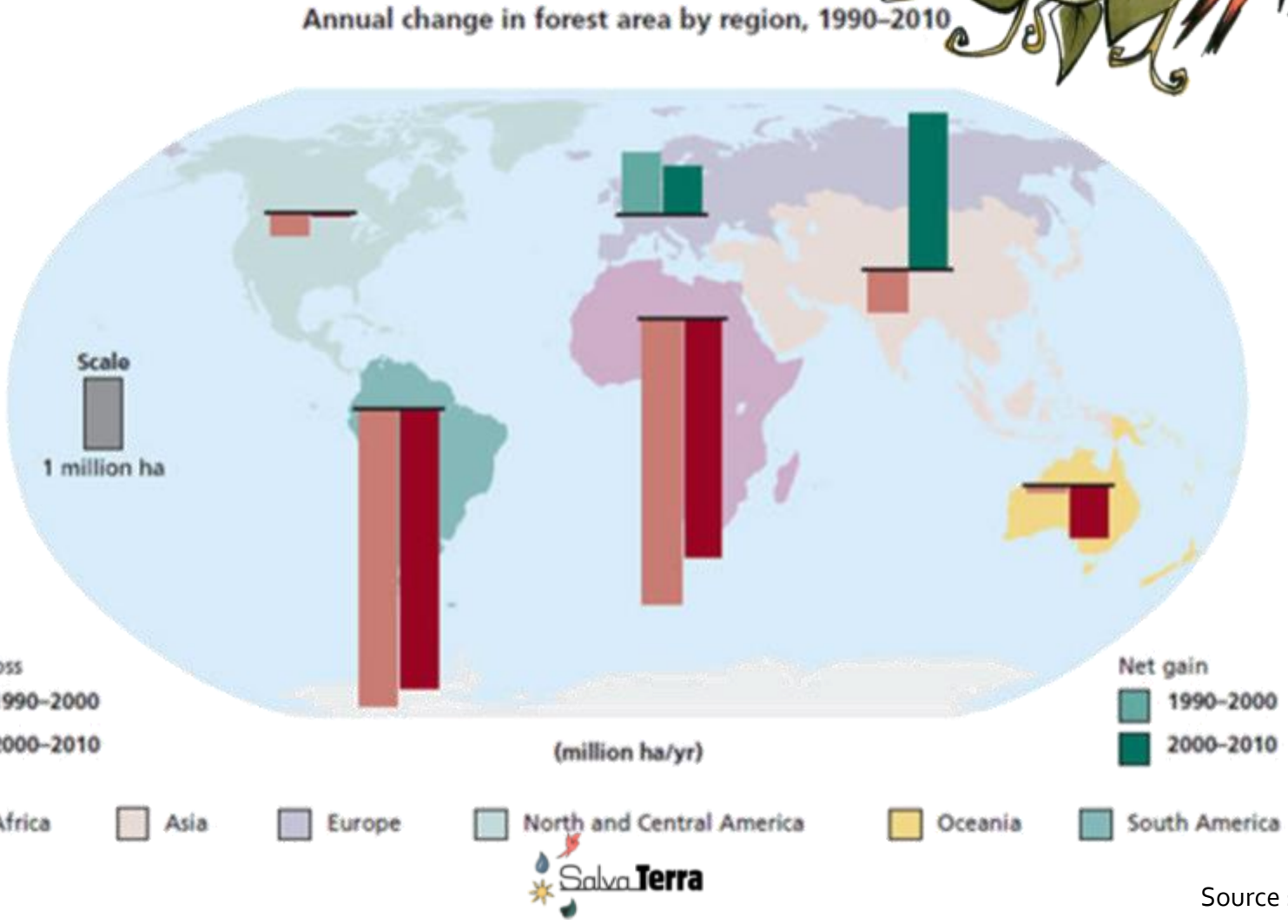
Source : FRA 2005

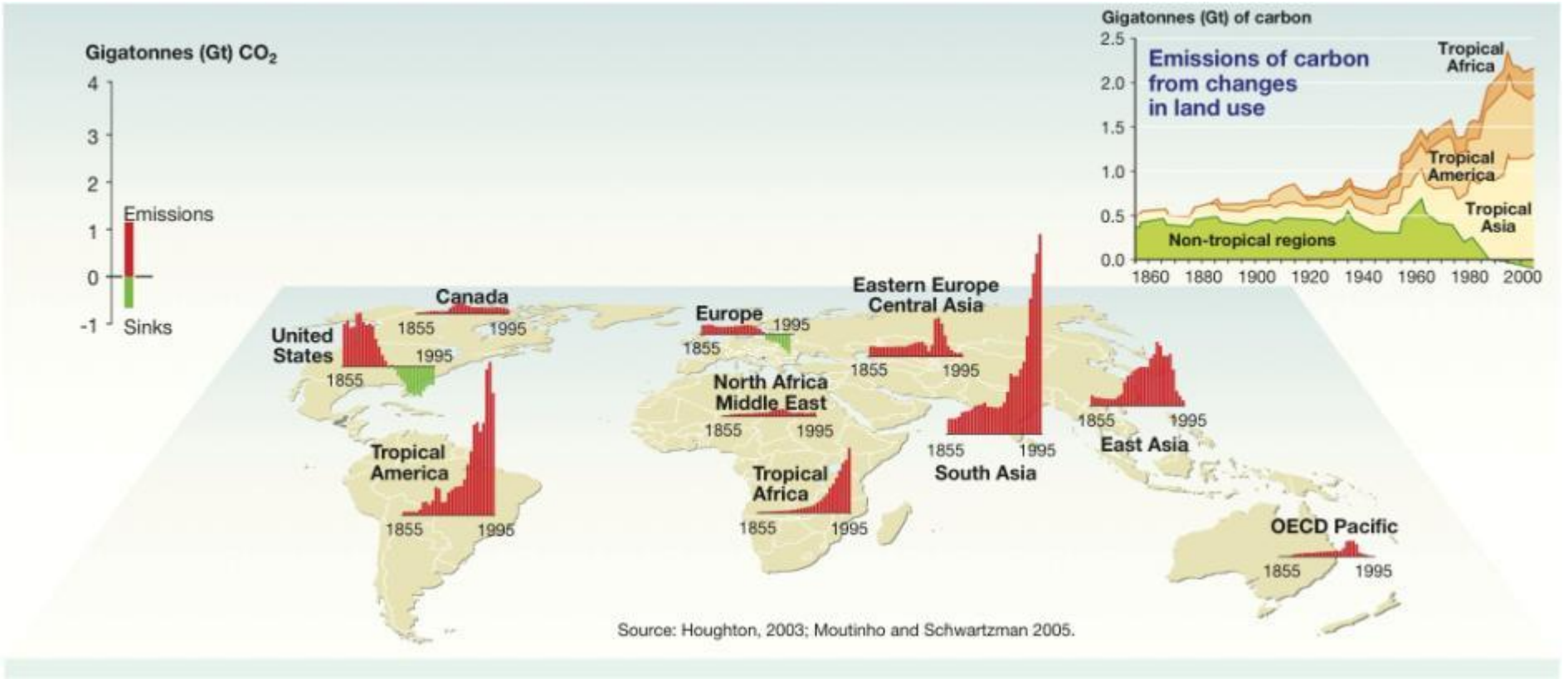
Changes in forest area (2/2)



Source : FRA 2010

Forest carbon balance (1/2)

Emissions from land use change 1855-1995:



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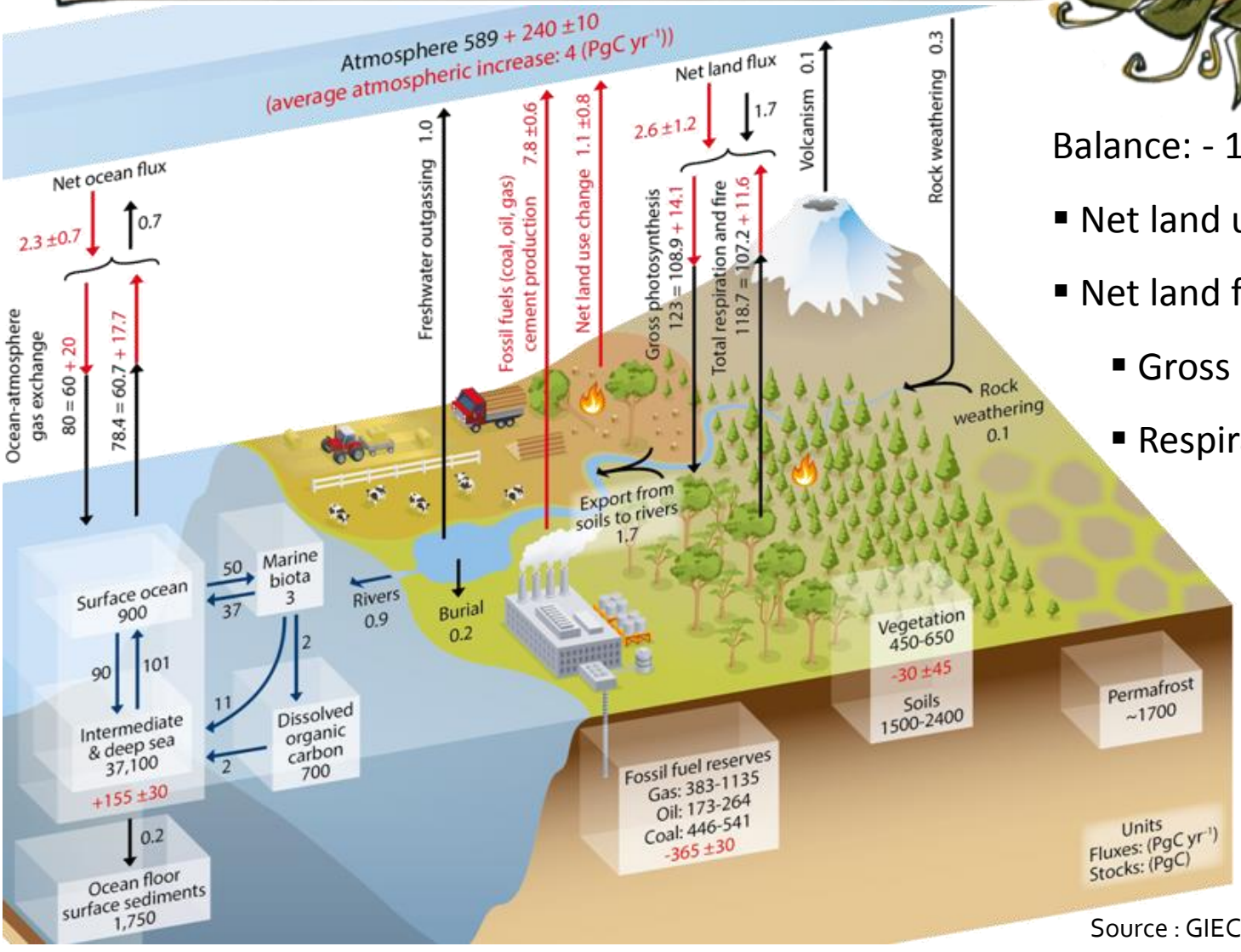
Forest carbon balance (2/2)



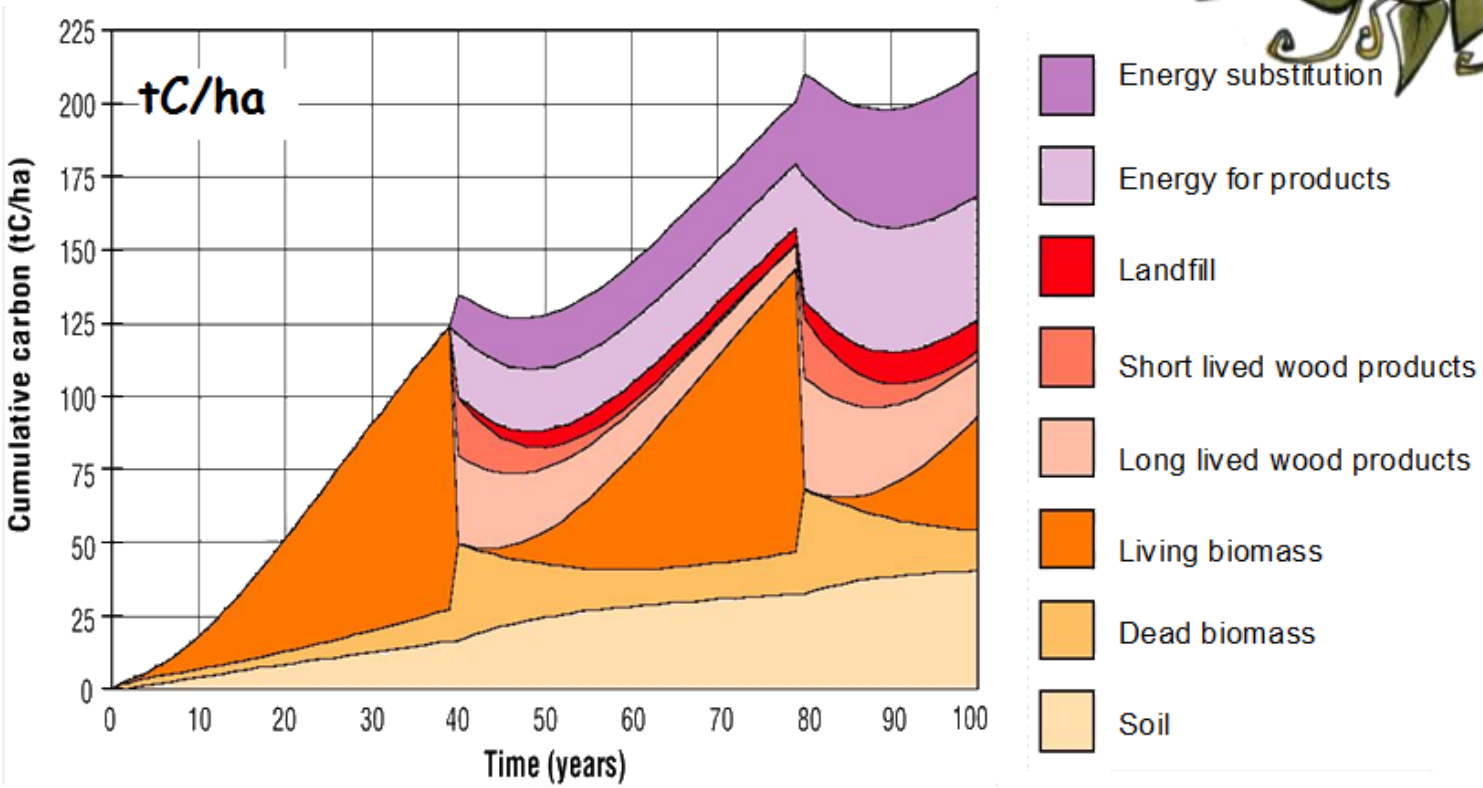
Balance: - 1,5 GtC/year

- Net land use change: +1,1 ± 0,8
- Net land flux: -2,6 ± 1,2
  - Gross photosynthesis: -123
  - Respiration and fire: +118,7

Forests are a net carbon sink

Source : GIEC 2013

Mitigate climate change through forests (1/2)



IPCC : Cumulative carbone changes for a scenario involving afforestation and harvest. These are net changes in that, for example, the diagram shows savings in fossil fuel emissions with respect to an alternative scenario that uses fossil fuels and alternative, more energy-intensive products to provide the same services (Marland and Schlamadinger 1999)

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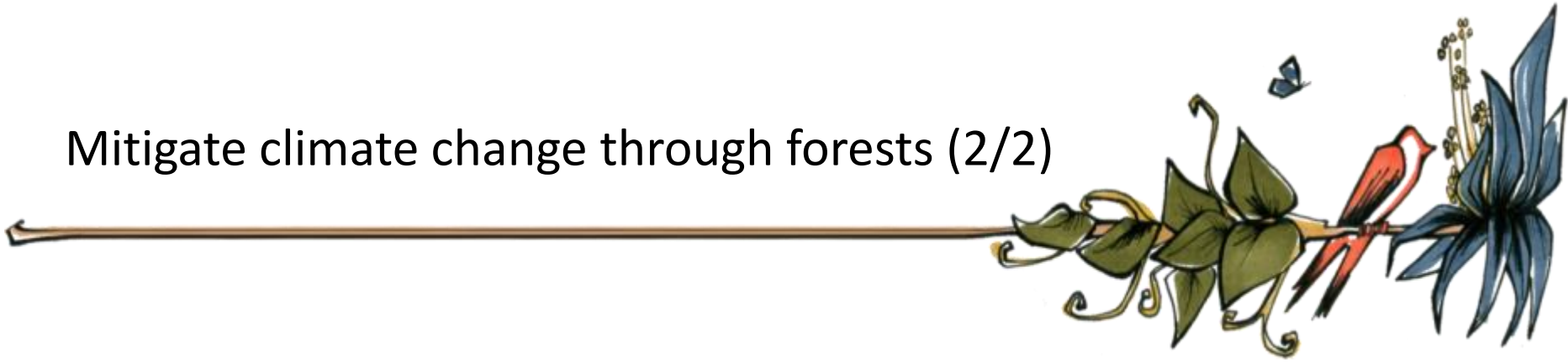
Mitigate climate change through forests (2/2)



Climate change mitigation through forests can be achieved by :

- Planting
- Avoiding deforestation
- Managing existing forests
- Using sustainably produced wood energy instead of fossil fuels or unsustainably produced wood
- Using sustainably produced wood instead of energy intensive materials

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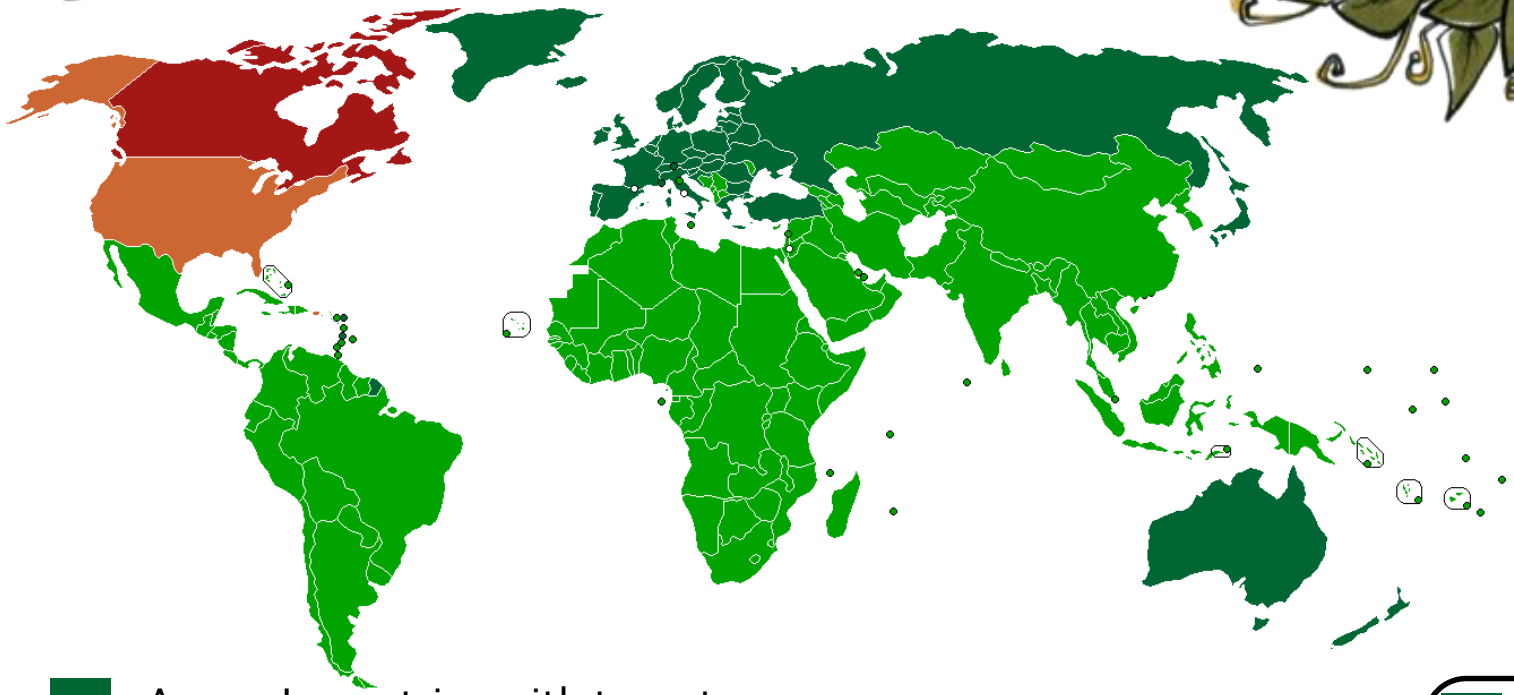
Parties to the UNFCCC



Annex I countries with targets

Developing countries without targets

Countries which took no position or have an unknown position

Countries with no intention to ratify the treaty

Countries which have withdrawn

Article 3.3 and 3.4

JI

CDM

REDD+

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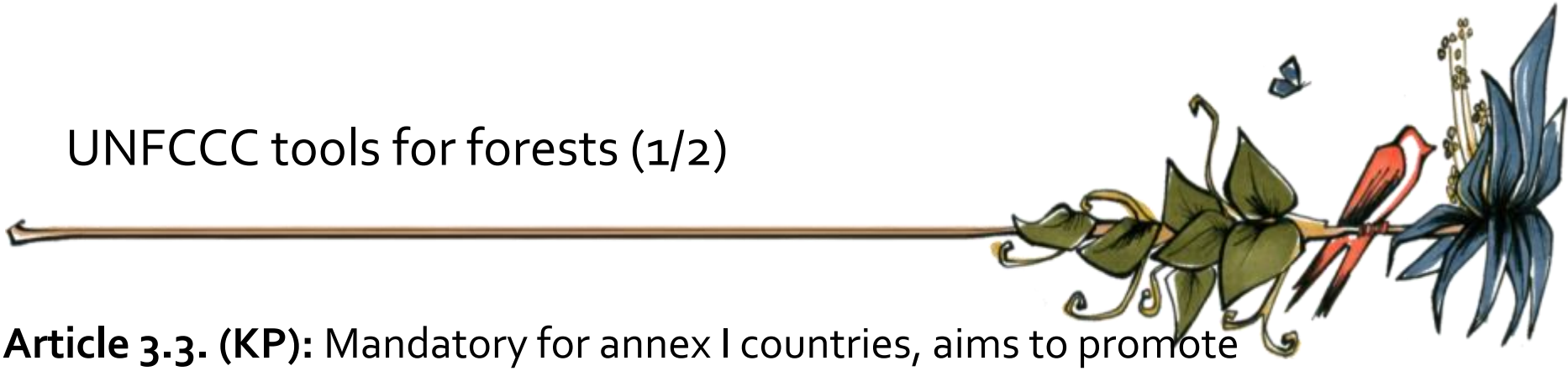
UNFCCC tools for forests (1/2)



Article 3.3. (KP): Mandatory for annex I countries, aims to promote afforestation/reforestation and reduce deforestation. Debit can be compensated by article 3.4.

Article 3.4. (KP): Voluntary, aims to promote carbon storage by forest, grasslands and croplands management and revegetation. Benefits almost certain for forests due to accounting rules, but capped.

Wood products and energy:
The Kyoto Protocol considers that the harvested wood is immediately oxidized. Under this assumption, we do not recognize the effect of storage in wood products.

The substitution effect is taken into account in “energy” and “industry” sectors. Biomass burnt for energy purposes is not accounted as an emission (already accounted for under article 3.4.)

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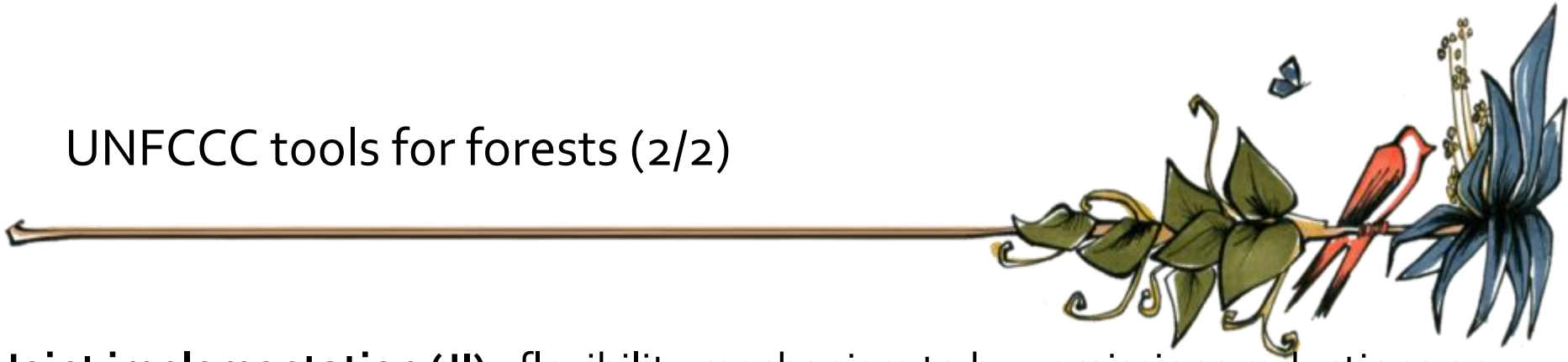
UNFCCC tools for forests (2/2)



Joint implementation (JI): flexibility mechanism to buy emissions reductions or absorptions increasement in other Annex I countries, including through afforestation/reforestation, energy substitution and materials substitution.

Clean development mechanism (CDM): as JI in developing countries. Adverse rules for plantations and non acceptance of forest carbon credits in the European Union Emissions Trading Scheme (main credits consumer).

REDD+: Aims to promote the reduction of emissions due to deforestation and forest degradation, as well as carbon absorption and storage by sustaibable forest management and afforestation/reforestation. Result-based mechanism, to be fully operationalized probably after 2020.

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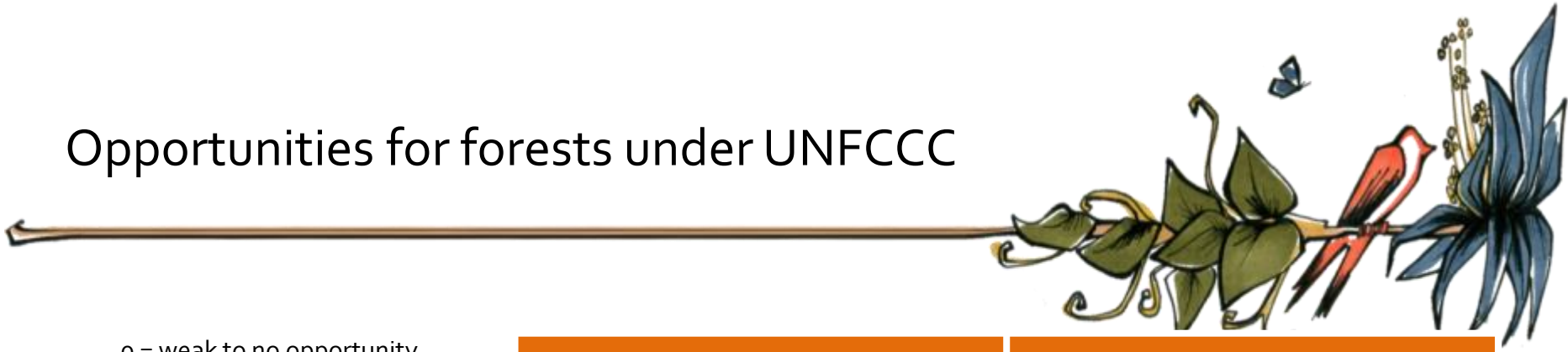
Opportunities for forests under UNFCCC



o = weak to no opportunity + = limited opportunity ++ = strong opportunity	Developed countries	Developing countries
Avoided deforestation	o	o
Plantation	++	+
Forest management	+	o
Storage in wood products	o	o
Energy substitution	+	++
Materiel subsitution	++	++

Other opportunities: voluntary carbon markets, fast start funding for REDD+, climate proofed official development aid, integration of CC in LDC's national development strategies…

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Article 12 of the Kyoto Protocol

Extracts

2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments […].

9. Participation under the clean development mechanism […] may involve private and/or public entities […].

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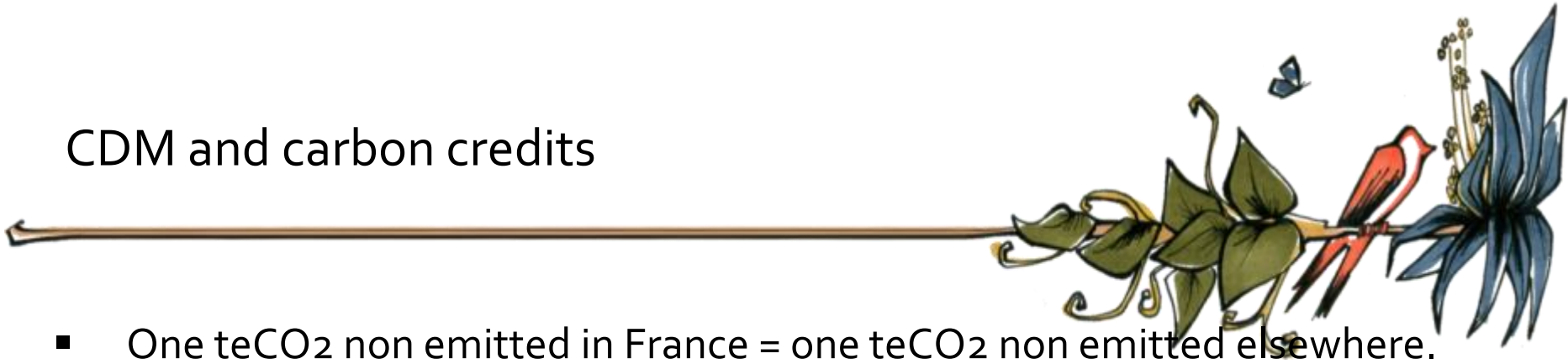
CDM and carbon credits



- One teCO2 non emitted in France = one teCO2 non emitted elsewhere.
- Help meet GHG emissions targets of companies and governments in developed countries.
- CDM "Carbon credit" = Certified Emission Reduction Units = CER
- CER are valid for 1 ton of carbon dioxide equivalent (teCO2)
- The ability of entities to use CERs to meet their compliance obligations are often limited by national legislation
- CER are shared the way project participants wish to
- They are issued in electronic registries from where they can be traded

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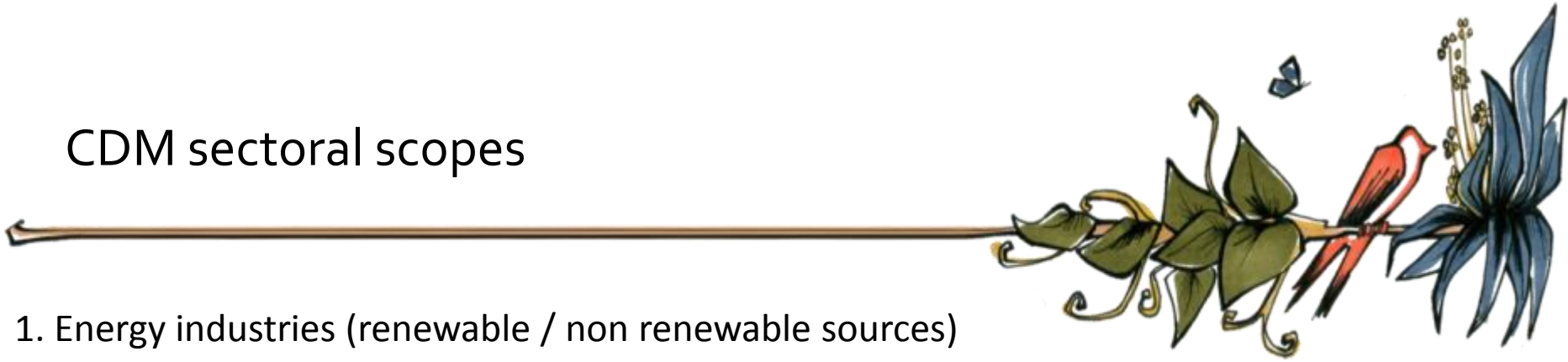
CDM sectoral scopes



1. Energy industries (renewable / non renewable sources)
2. Energy distribution
3. Energy demand
4. Manufacturing industries
5. Chemical industry
6. Construction
7. Transport
8. Mining/Mineral production
9. Metal production
10. Fugitive emissions from fuels (solid, oil and gas)
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
12. Solvents use
13. Waste handling and disposal
14. Afforestation and reforestation
15. Agriculture

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CDM insight

Number of CDM project activities	7 984
Number of registered CDM project activities	7 786
Number of CDM project activities that have issued CERs	3 100
CERs issued	1,87 billion
Potential supply of CERs to the end of all current crediting periods	8,89 billion

www.unfccc.int, 22nd November 2017

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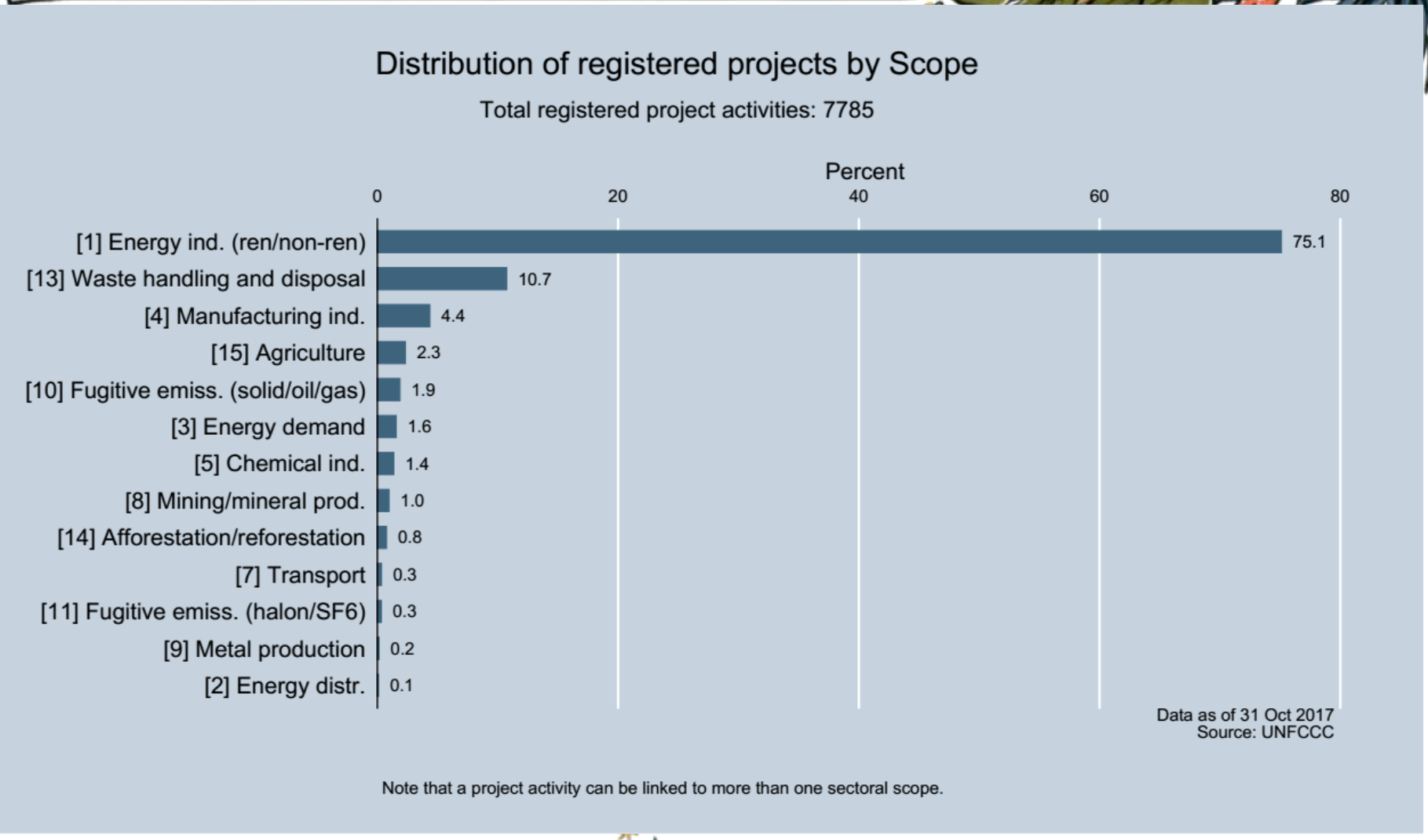
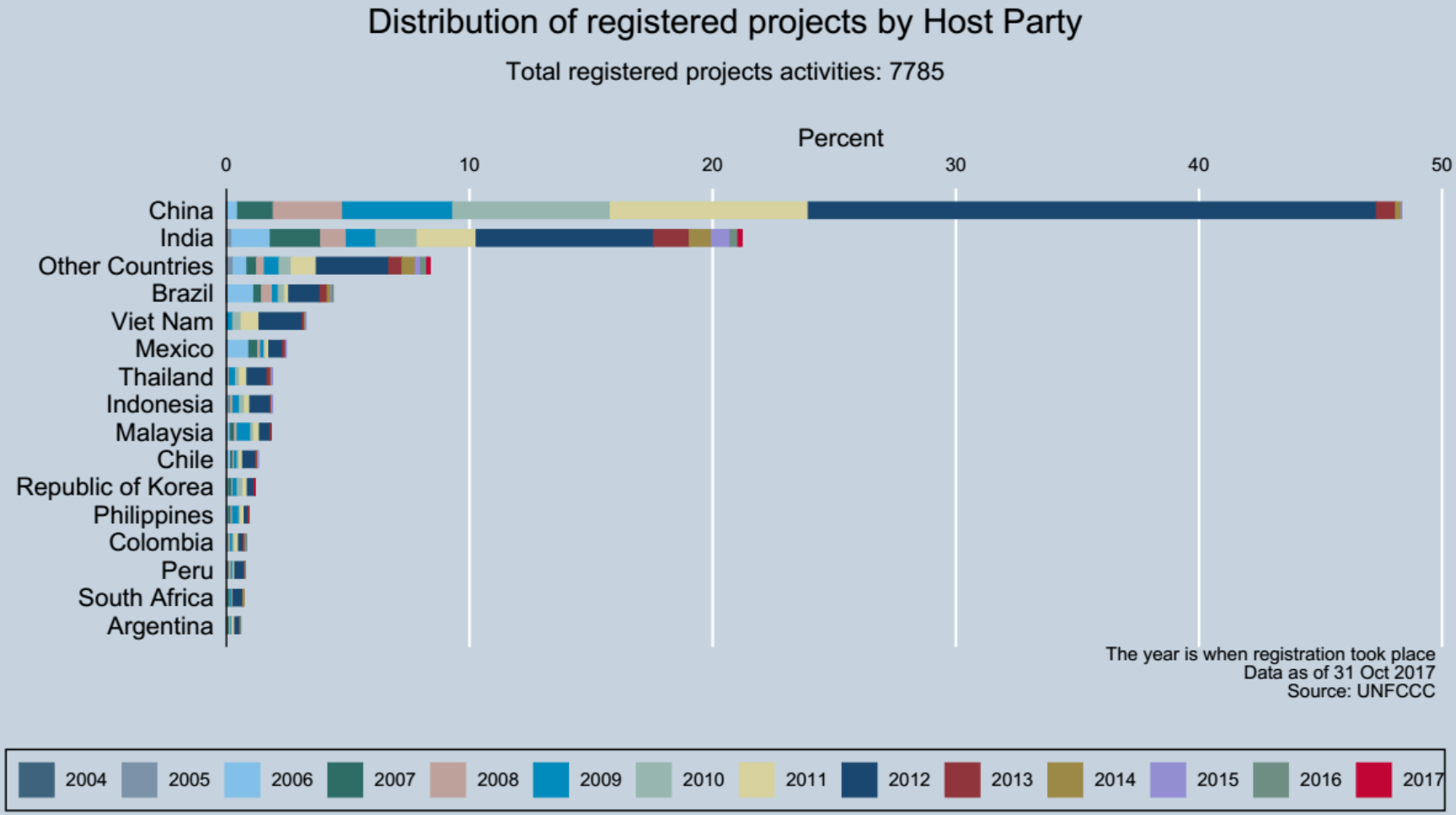
Sectoral distribution of projects



Geographical distribution of projects



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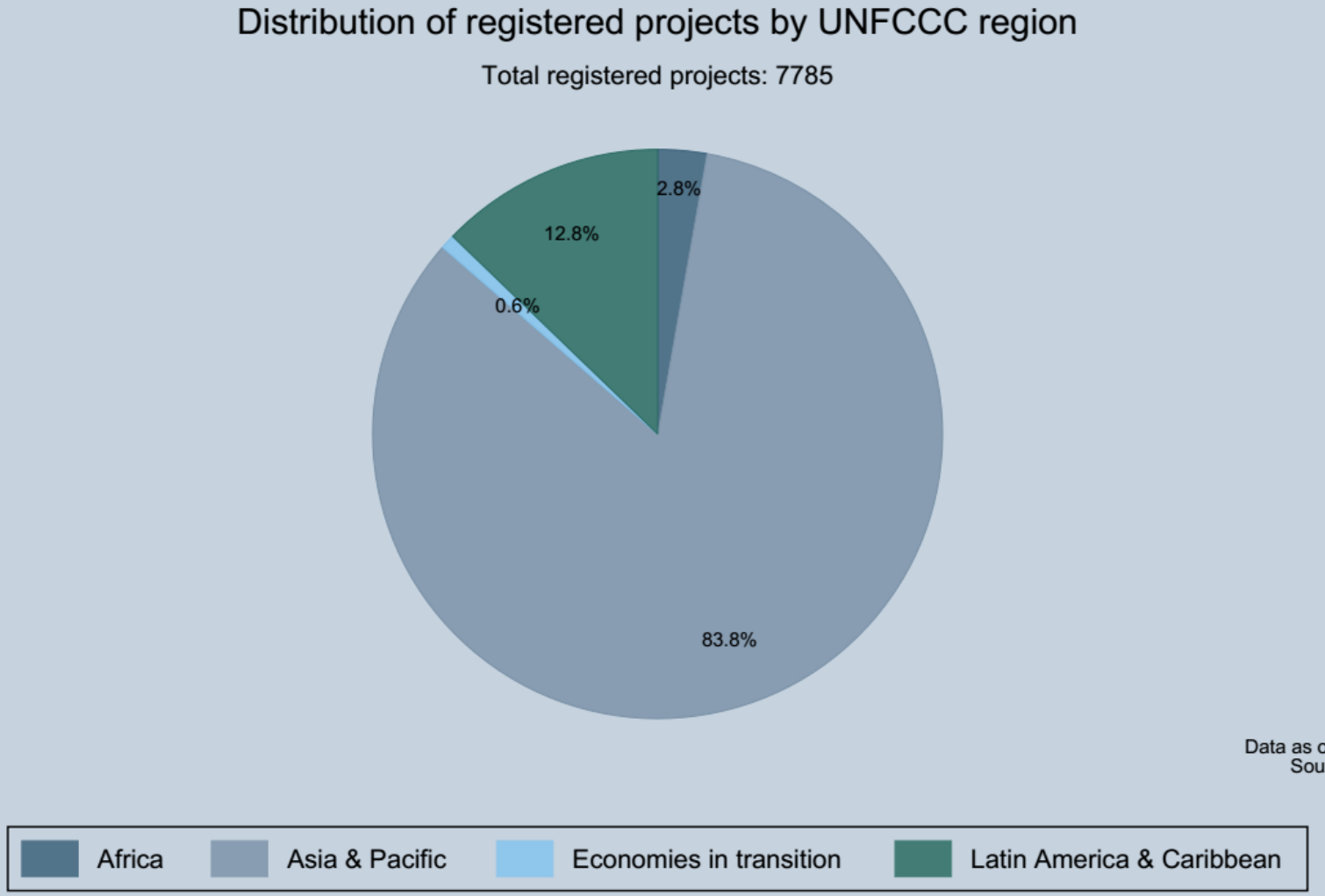
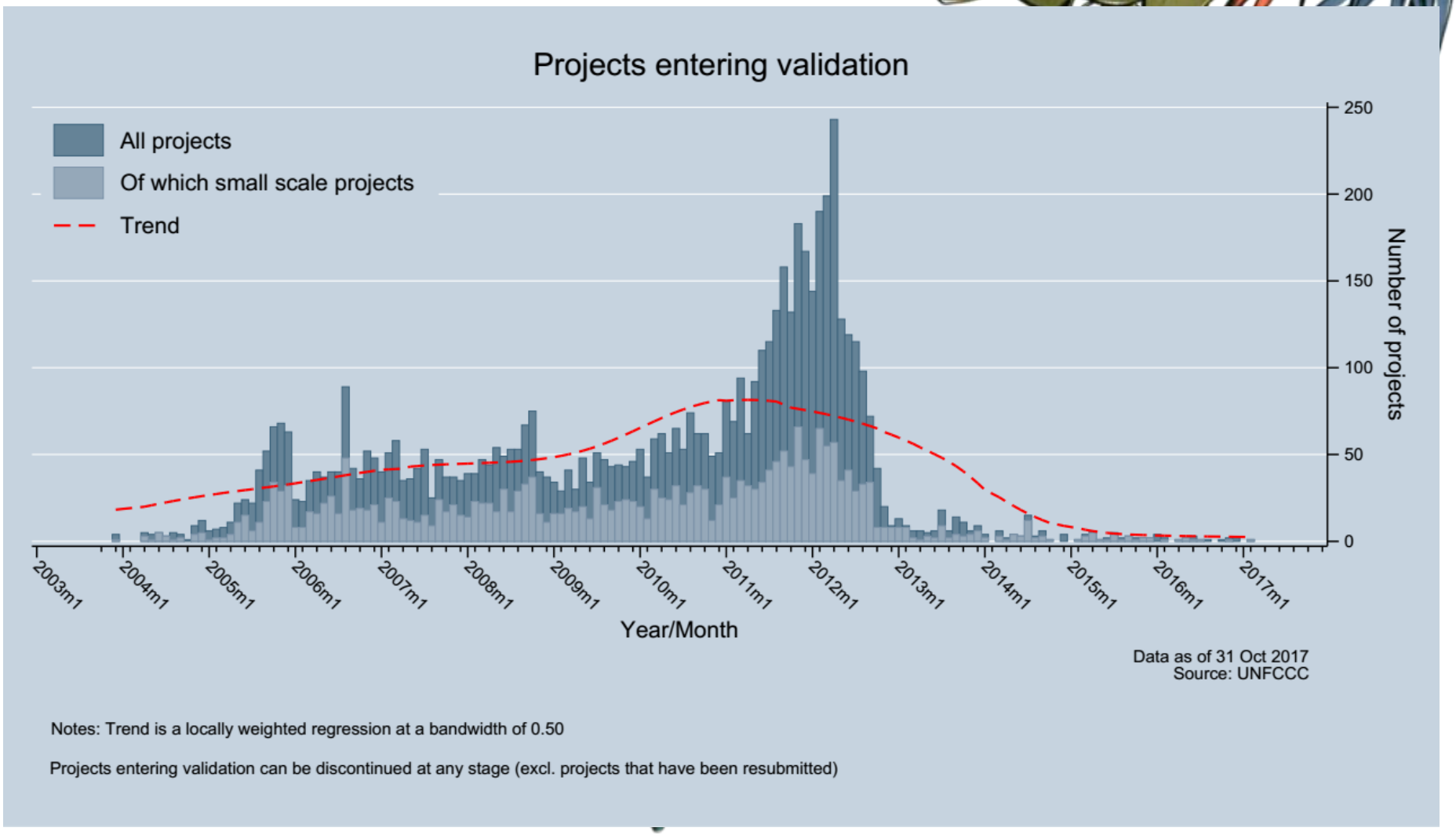


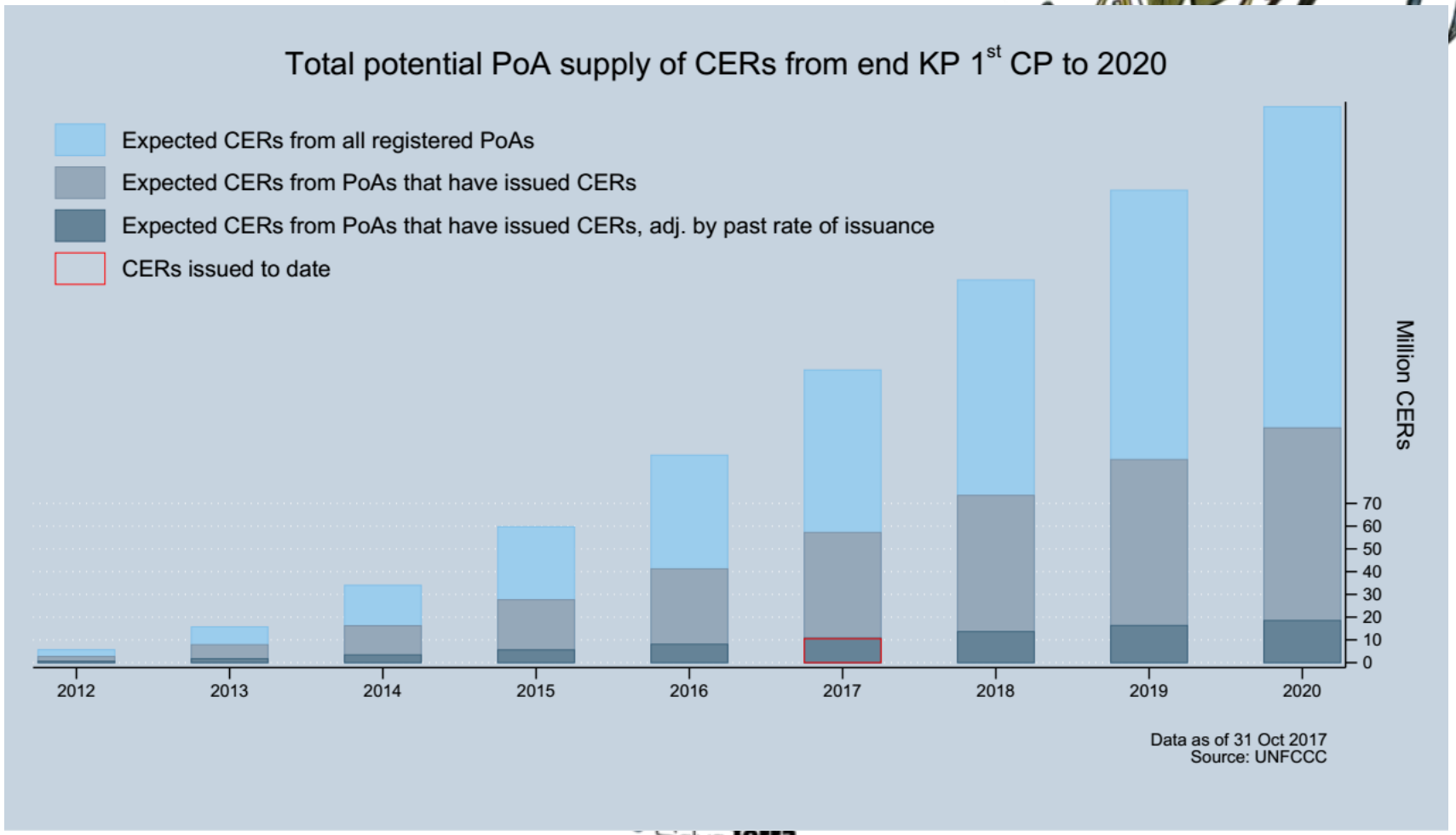
Trends (1/3)



Notes: Trend is a locally weighted regression at a bandwidth of 0.50

Projects entering validation can be discontinued at any stage (excl. projects that have been resubmitted)

Trends (2/3)


Total potential PoA supply of CERs from end KP 1st CP to 2020
Expected CERs from all registered PoAs
Expected CERs from PoAs that have issued CERs
Expected CERs from PoAs that have issued CERs, adj. by past rate of issuance
CERs issued to date
Million CERs
70
60
50
40
30
20
10
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Data as of 31 Oct 2017
Source: UNFCCC

Trends (3/3)

http://carbonfinanceforcookstoves.org/carbon-finance/prices-for-improved-cookstove-projects/

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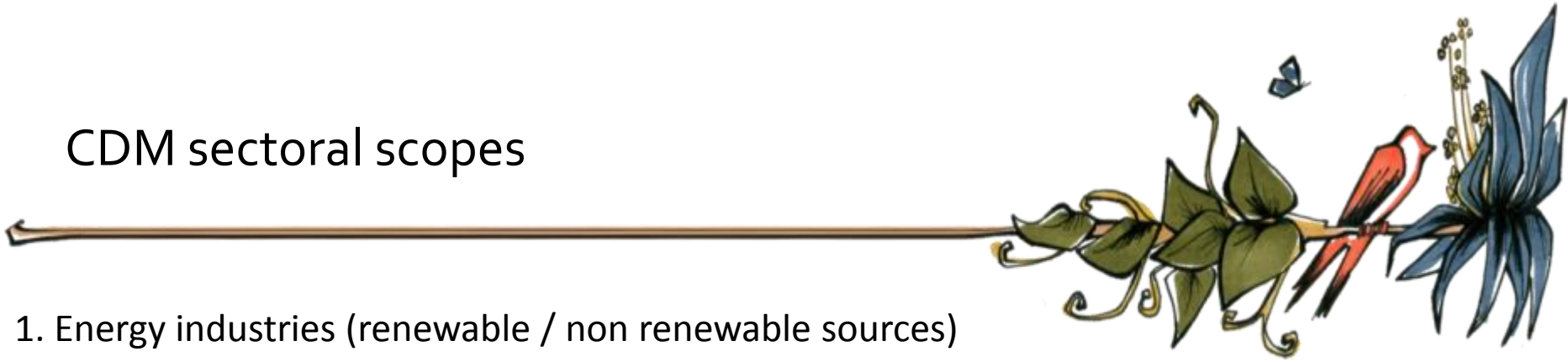

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CDM for forest carbon stocks

1. Energy industries (renewable / non renewable sources)

3. Energy demand

CDM promotes mitigation by increasing/conserving forests carbon stocks

14. Afforestation and reforestation

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CDM through sustainably produced wood

1. Energy industries (renewable / non renewable sources)

Forests products can be part of mitigation actions by reducing emissions in other sectors

6. Construction

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Why only 0,6% of projects are A/R ? (1/3)

Technical difficulties

Complex monitoring, difficulty in selecting eligible land (needs remote sensing data for 1989).

Methodologies and tools for making calculations are highly complex, require a high level of expertise and significant amounts of data that are often not available.

Land tenure and carbon ownership

Need to clarify tenure and use rights not only for land but also for the five carbon pools and the carbon itself.

Source: ITTO's Tropical Forests Update Online Newsletter, Issue 18 No. 3 2008

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Why only 0,6% of projects are A/R ? (2/3)

Economical constraints

High costs for the project development, validation and monitoring, verification and certification of C stocks.

Difficulties to identify investors or project donors at an early stage of project development.

Reduced access to markets:

• A/R credits excluded from the EU Emissions Trading Scheme (ETS), main C consumer, because of uncertainties and risks specific to carbon sinks.

• 1% ceiling on the use of A/R CDM sink credits by Annex-I countries

Source: ITTO's Tropical Forests Update Online Newsletter, Issue 18 No. 3 2008

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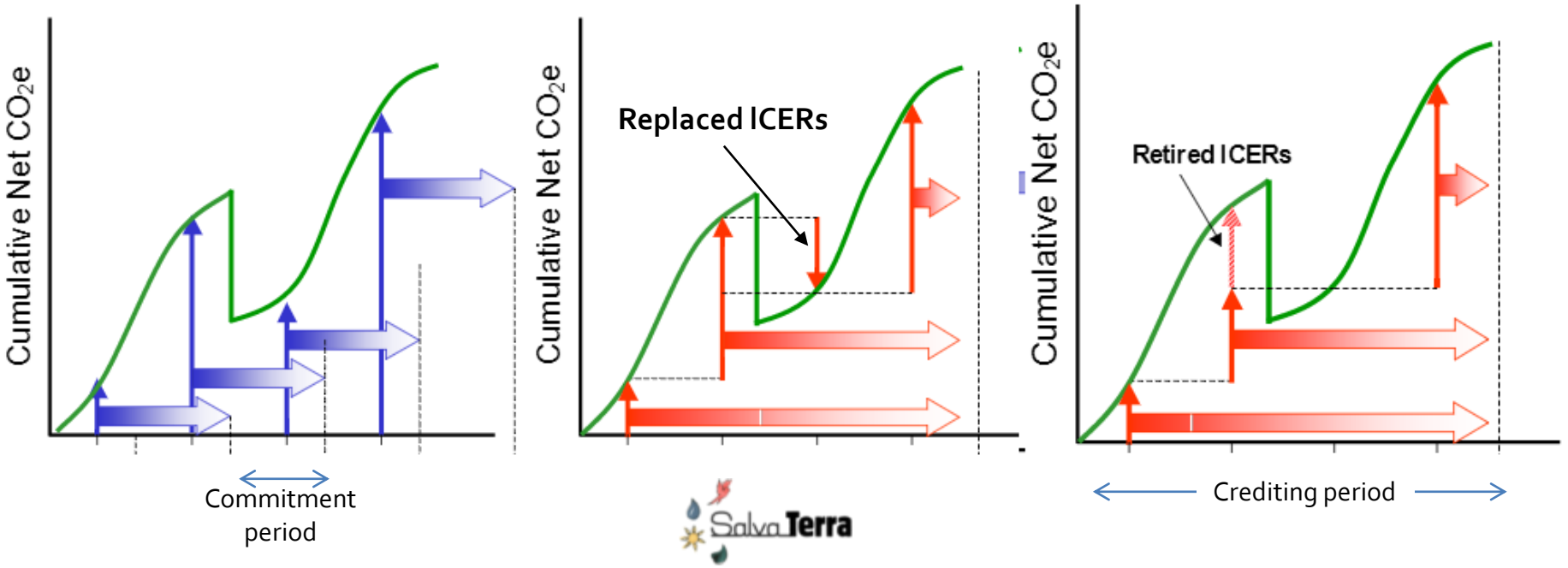
Why only 0,6% of projects are A/R ? (3/3)

Non-permanence:

Planted forests can disapear in the future -> carbon storage can be considered as non-permanent. Non-permanence is dealt with (i) temporary credits (**tCERs**) or (ii) long term credits (**lCERs**), having a lower price than other credits, **making A/R CDM projects less attractive.**



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Focus on A/R projects

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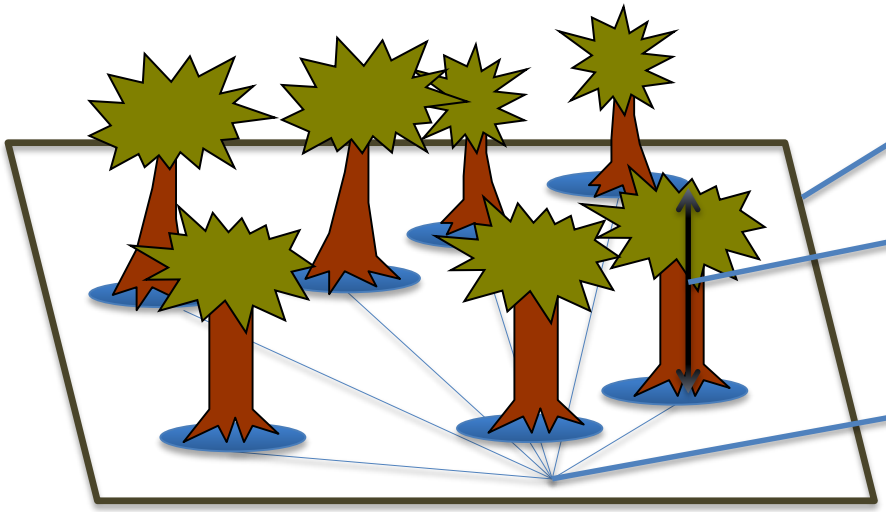
CDM definition of forest



Area: 0,05 to 1 ha

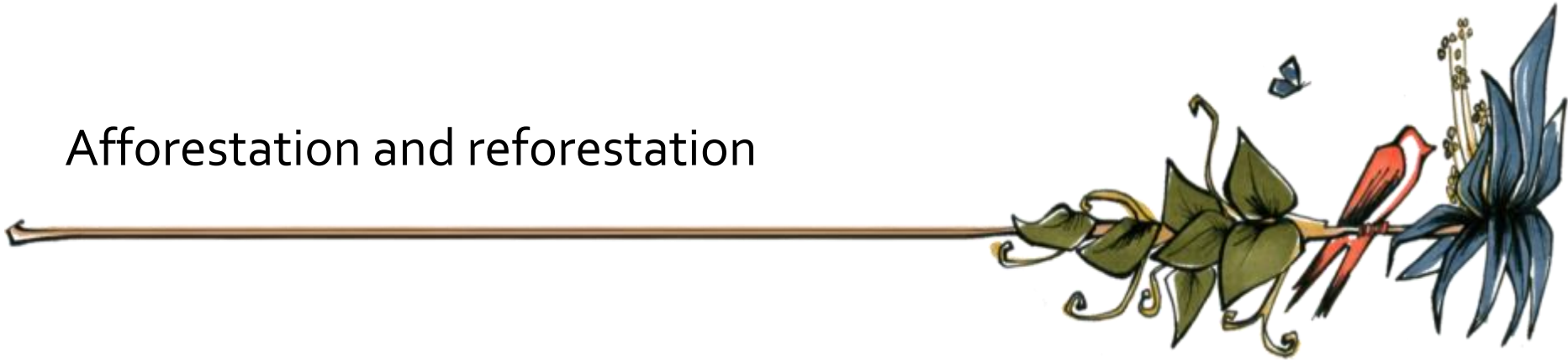
Height at maturity: 2 to 5 m

Coverage at maturity:
10 to 30%

Each country sets its thresholds (see http://cdm.unfccc.int/DNA/index.html)
Example of Laos:

For afforestation and reforestation project activities - Host Party's selected single minimum:			Host Party's minimum selected values for A/R project activities include:	
A single minimum tree crown cover value between 10 and 30 per cent	A single minimum land area value between 0,05 and 1 hectare	A single minimum tree height value between 2 and 5 metres	Palm trees	Bamboos
20	0,5	5	No	No

Afforestation and reforestation



Reforestation

Project area was not covered by forests on 31/12/1989

Afforestation

Project area is not covered by forests for at least 50 years

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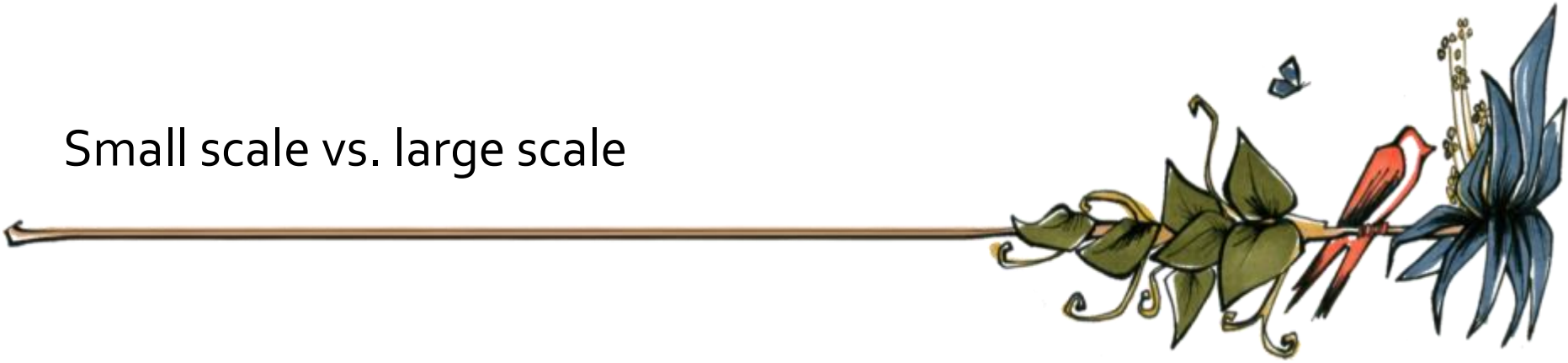
Small scale vs. large scale



Small-scale methodologies are grouped into three different types:

- Type I: Renewable energy project activities with a maximum output capacity of 15 MW (or an appropriate equivalent)

- Type II: Energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, with a maximum output (i.e. maximum savings) of 60 GWh per year (or an appropriate equivalent)

- Type III: Other project activities that result in emission reductions of less than or equal to 60 ktCO2e per year **(16 ktCO2e for A/R projects)**

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Small scale vs. large scale

Box 4.2 Small-scale A/R CDM project activities

A/R CDM project activities that are expected to result in net anthropogenic greenhouse gas (GHG) removals by sinks of less than 16,000 tCO_2 per year qualify as 'small-scale afforestation and reforestation (SSC A/R) project activities'. The SSC A/R CDM project activities must be developed or implemented by 'low-income communities and individuals as determined by the host Party'. If an SSC A/R CDM project activity results in net anthropogenic GHG removals by sinks greater than 16,000 tCO_2 per year, the excess removals are not eligible for the issuance of tCERs or lCERs.

The requirements in respect of SSC A/R CDM project activities are less stringent than those for large-scale A/R CDM project activities in the following respects: (i) The same DOE who validates a project activity can also perform verification and certification; (ii) The baseline scenario is deemed to be the continuation of pre-project land-use scenario; (iii) Additionality can be demonstrated by showing that the project faces one or more barriers from a list of barriers contained in the appendix of the methodology; (iv) Several project activities may be bundled for the purpose of validation, although the size of the bundle must remain within the limit of 16,000 tCO_2 per year; (v) An overall monitoring plan may be proposed for a bundle of project activities.

SSC AR

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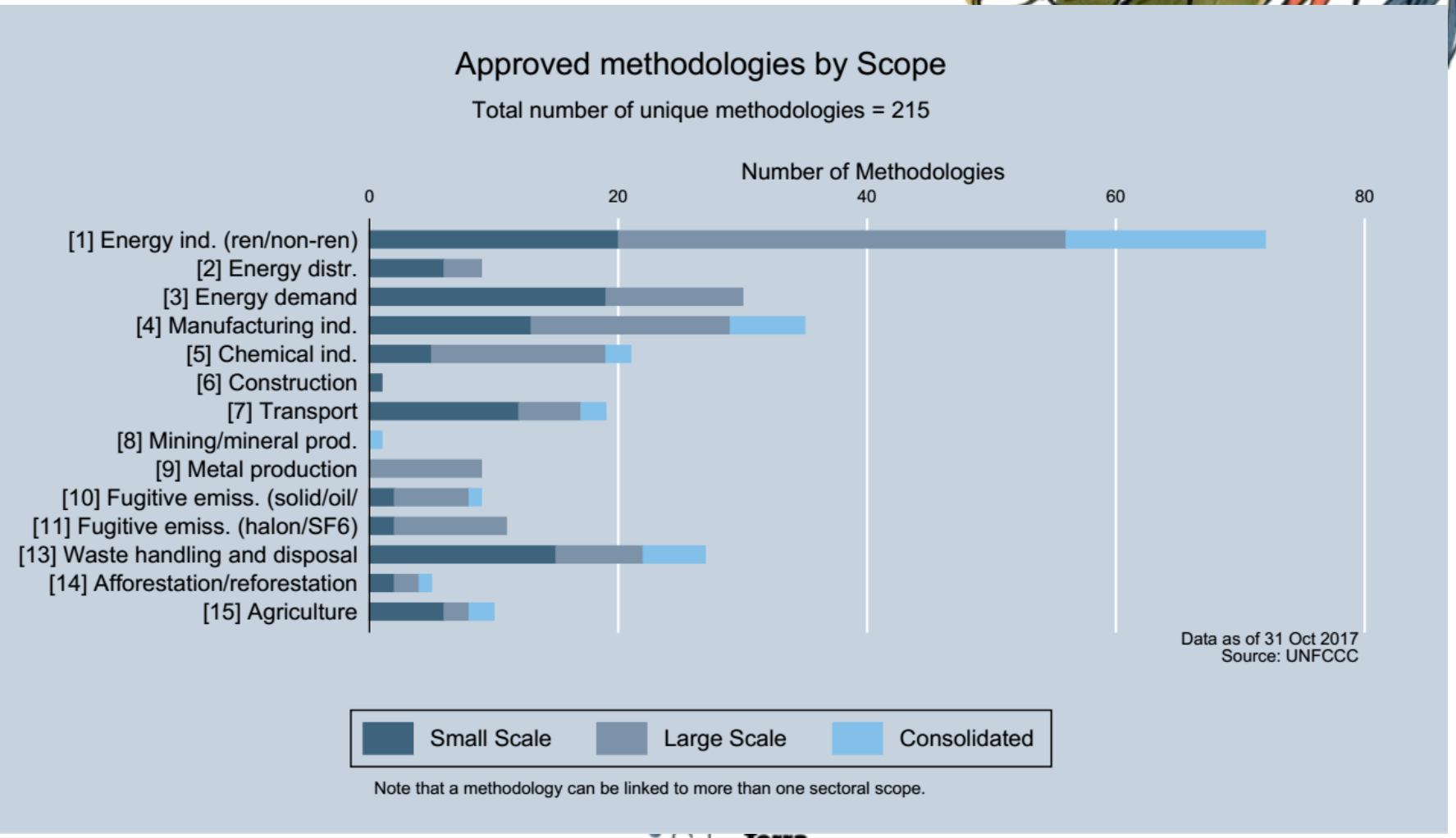
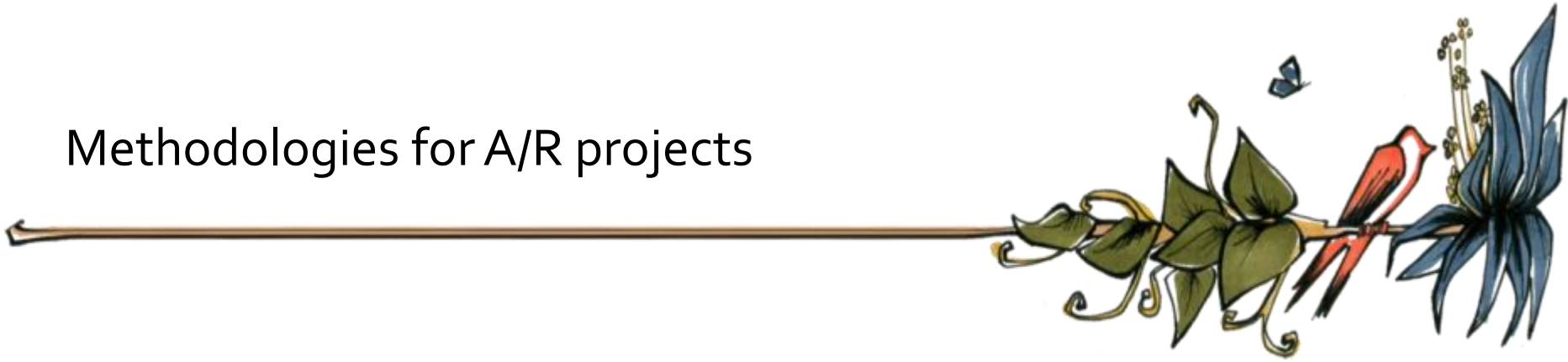
Existing methodologies and tools



Methodologies for A/R projects



Large scale

- AR-AM0014: Afforestation and reforestation of degraded mangrove habitats (here)
- AR-ACM0003: Afforestation and reforestation of lands except wetlands (here)

Small scale

- AR-AMS0003: Afforestation and reforestation project activities implemented on wetlands (here)
- AR-AMS0007: Afforestation and reforestation project activities implemented on lands other than wetlands (here)

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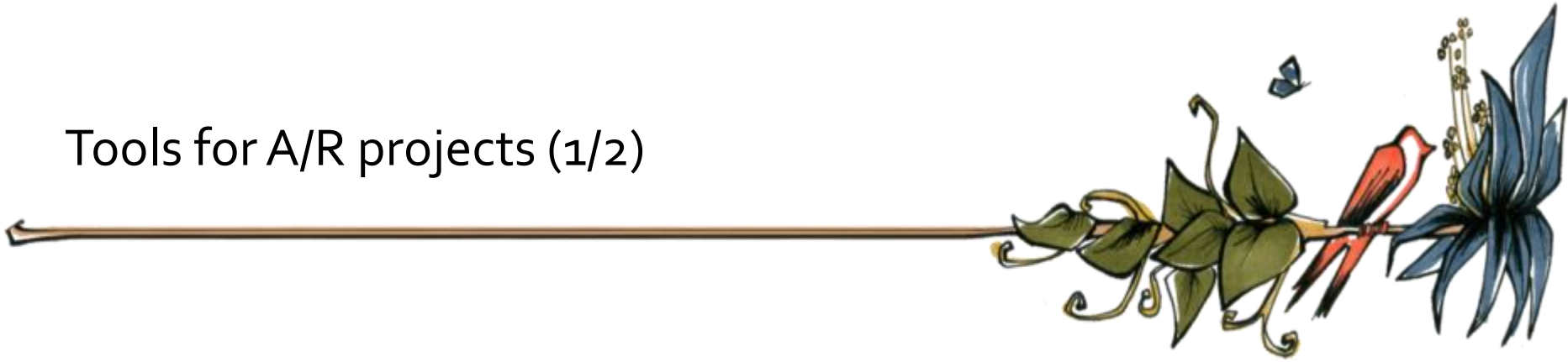
Tools for A/R projects (1/2)



EB 35 annex 19: Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (here)

EB 58 annex 15: Calculation of the number of sample plots for measurements within A/R CDM project activities (here)

EB 65 annex 31: Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity (here)

EB 58 annex 14: Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities (here)

EB 60 annex 13: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (here)

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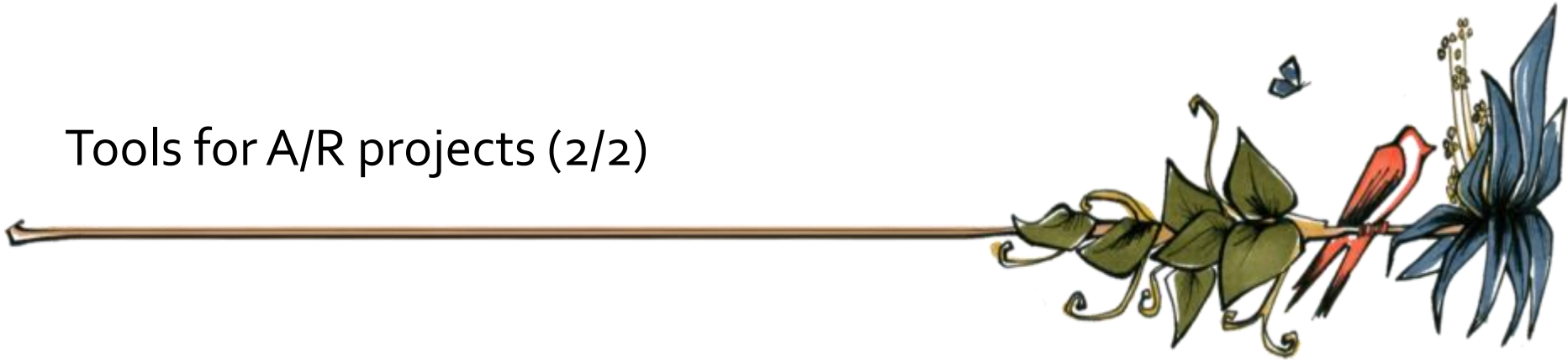
Tools for A/R projects (2/2)



EB 51 annex 15: Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity (here)

EB 60 annex 12: Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities (here)

EB 65 annex 28: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities (here)

EB 65 annex 29: Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities (here)

EB 75 annex 25: Demonstration of eligibility of lands for A/R CDM project activities (here)

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Demonstrate eligibility of A/R sites

Land is not forested at the beginning of the project:

- Existing vegetal cover remains below national ranges of forest definition
- Natural regeneration without project will not become forest
- Lands is not "temporarily unstocked" due to human causes

Land was not forested at 31/12/1989

Requirements:

- National definition of forest
- Reliable data (photos, inventory…) of vegetal cover before project starts
- Historic data (local survey, satellite imagery…)

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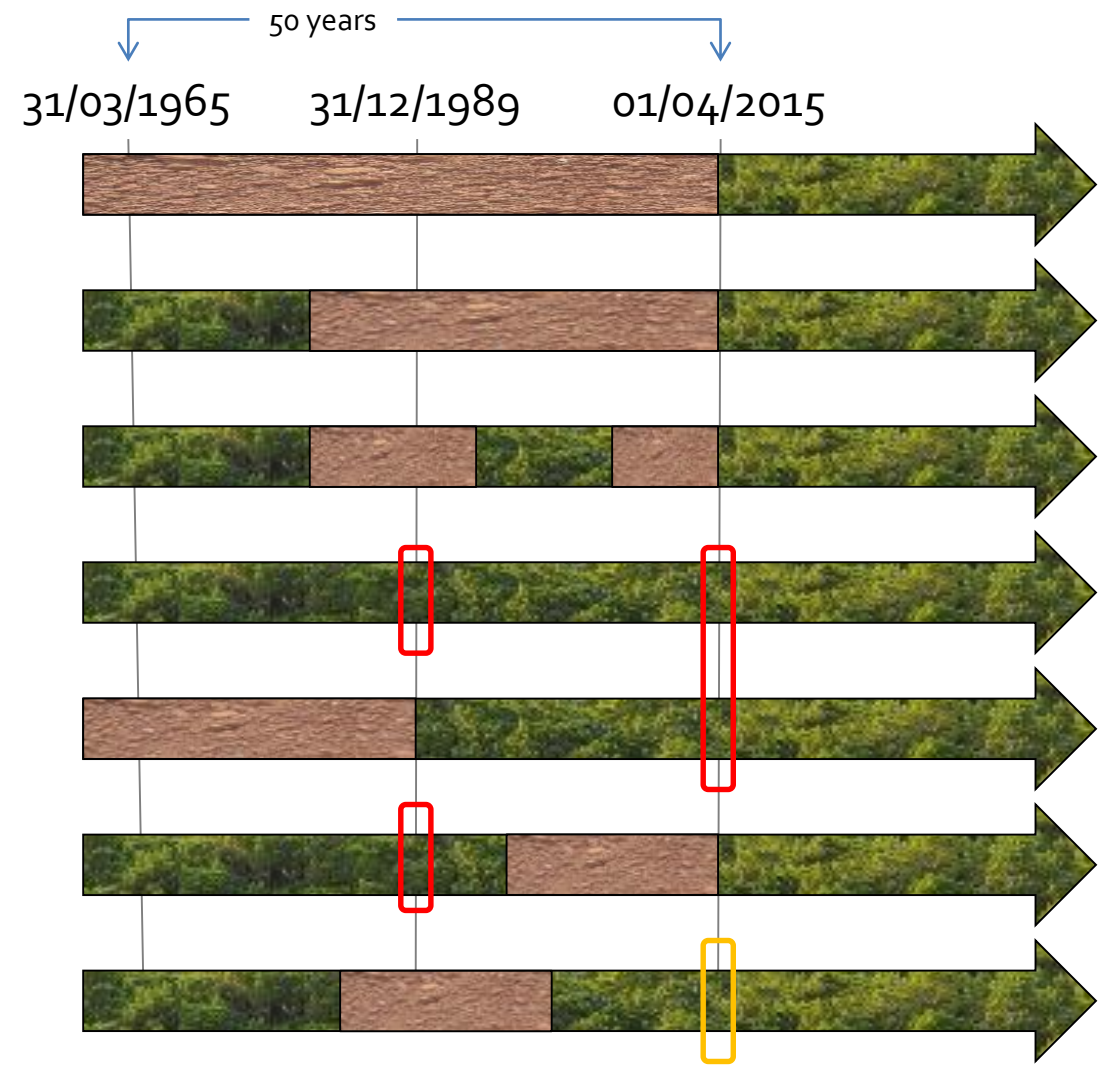
01/01/1990: Awareness about climate change



Afforestation

Reforestation

Forest

Non forest

Not eligible

Eligible if the project started before the date of its registration and if the developer was seriously considering sale of CERs in the decision to proceed

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Geographical boundaries

The "project boundary" : project activity under the control of the project participants. It may contain more than one discrete areas of land.

Example of an A/R project

Geographical boundaries

Existing forests to be excluded

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Geographical boundaries

Project boundaries

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Geographical boundaries

It may not have plantation, all project area must be monitored during CDM project life

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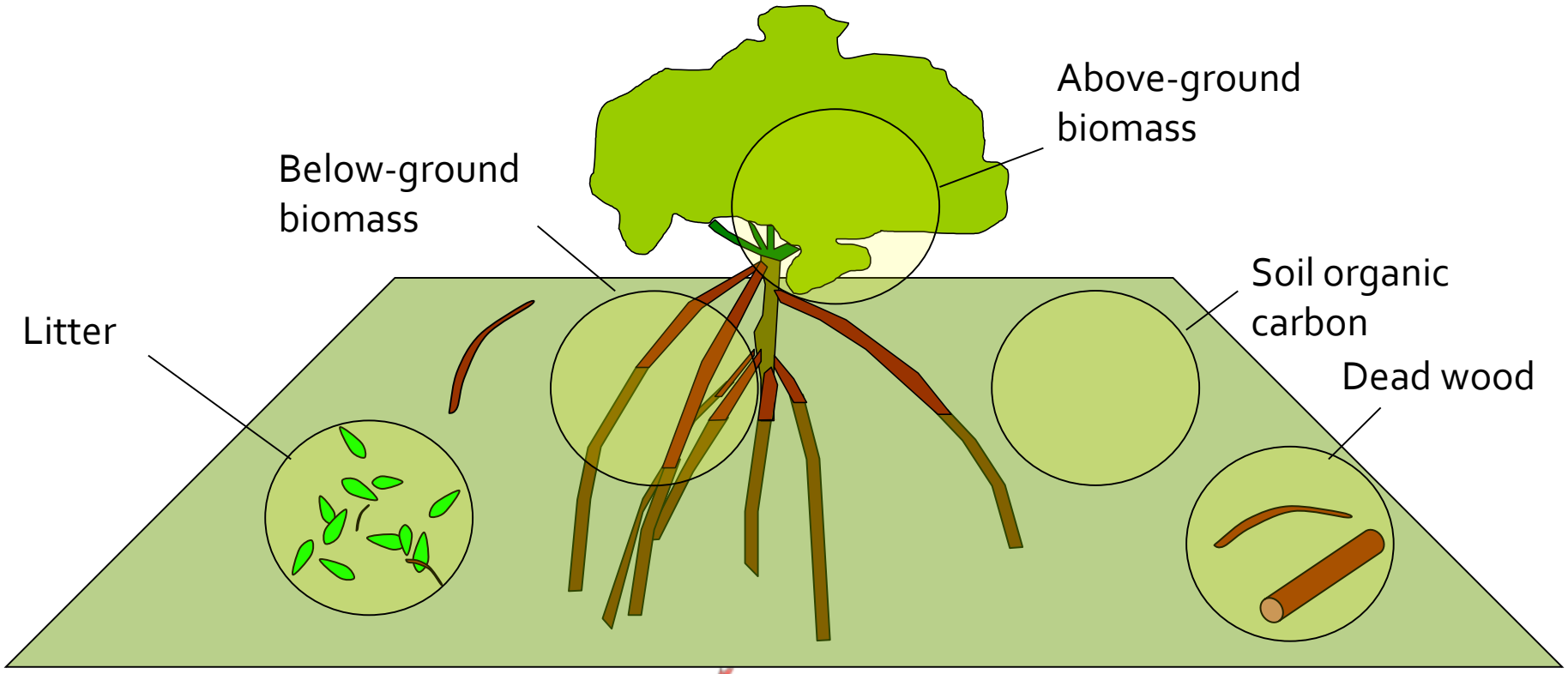
Forest carbon pools

IPCC guidelines



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Project lifetime

The crediting period of a CDM project activity will be either:

- A maximum of seven years (twenty years for A/R project activities) which may be renewed at most two times, or

- A maximum of ten years (thirty years for A/R project activities) with no option of renewal.

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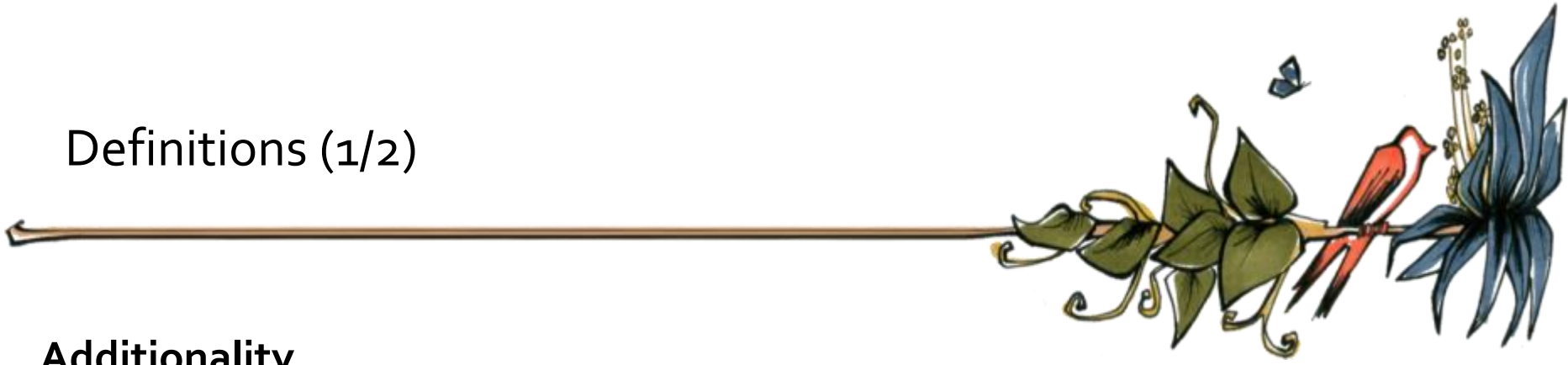
Definitions (1/2)



Additionality

CDM is a flexibility mechanism to assist Parties included in Annex I in achieving compliance with their commitments. It must support only additional activity **compared to a business as usual scenario** (=baseline).

A CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced ***below those that would have occurred in the absence of the registered CDM project activity*** (3/CMP.1, Annex, paragraph 43).

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Definitions (2/2)

Baseline

The baseline (or *'baseline scenario*') for a CDM project activity is defined in 3/CMP.1, Annex, paragraph 44 as follows:

The baseline for a CDM project activity is the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur ***in the absence of the proposed project activity*** *(3/CMP.1, Annex, paragraph 44).*

The baseline can be used to determine: whether a CDM project activity is additional and the volume of additional greenhouse gas emission reductions achieved by a project activity.

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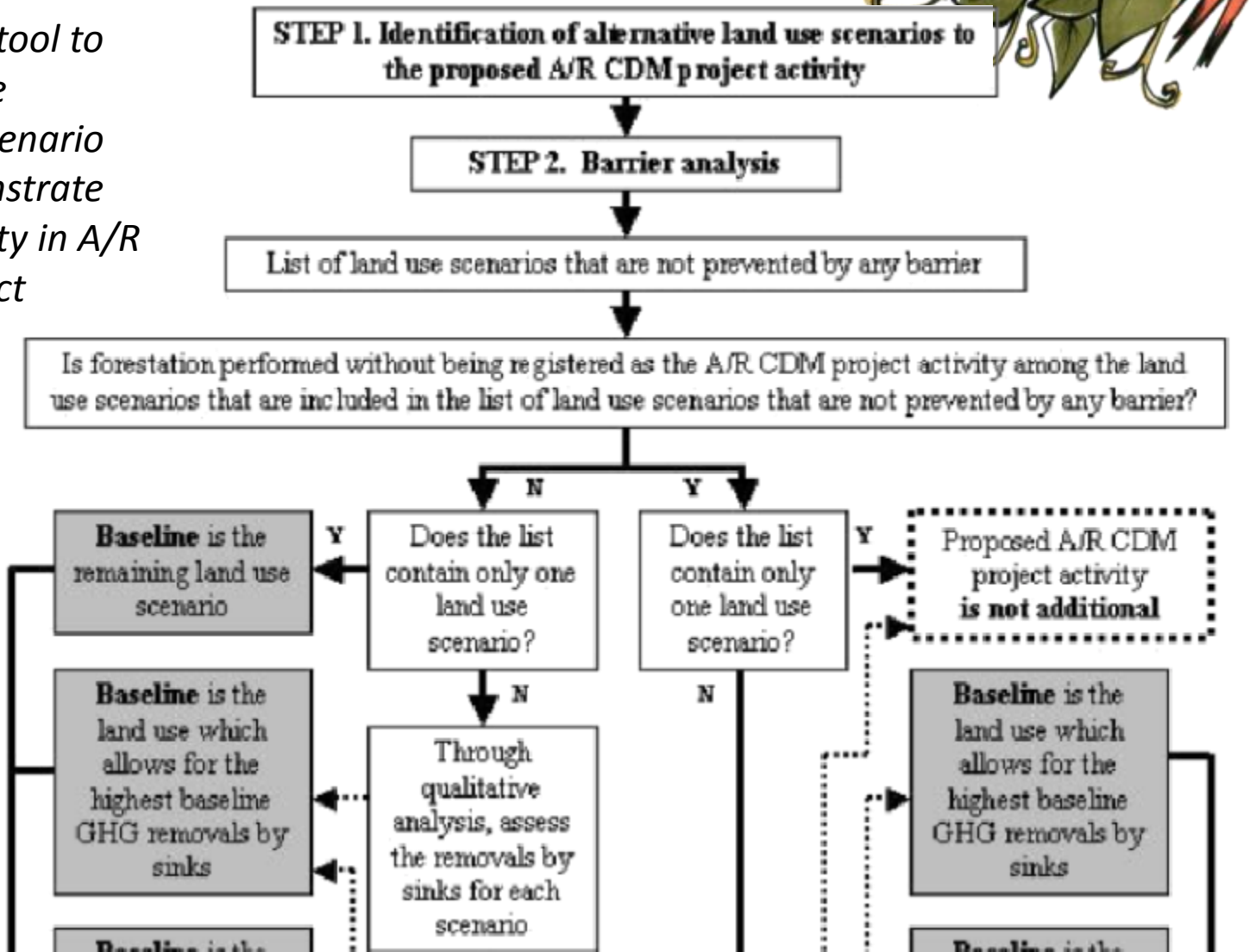
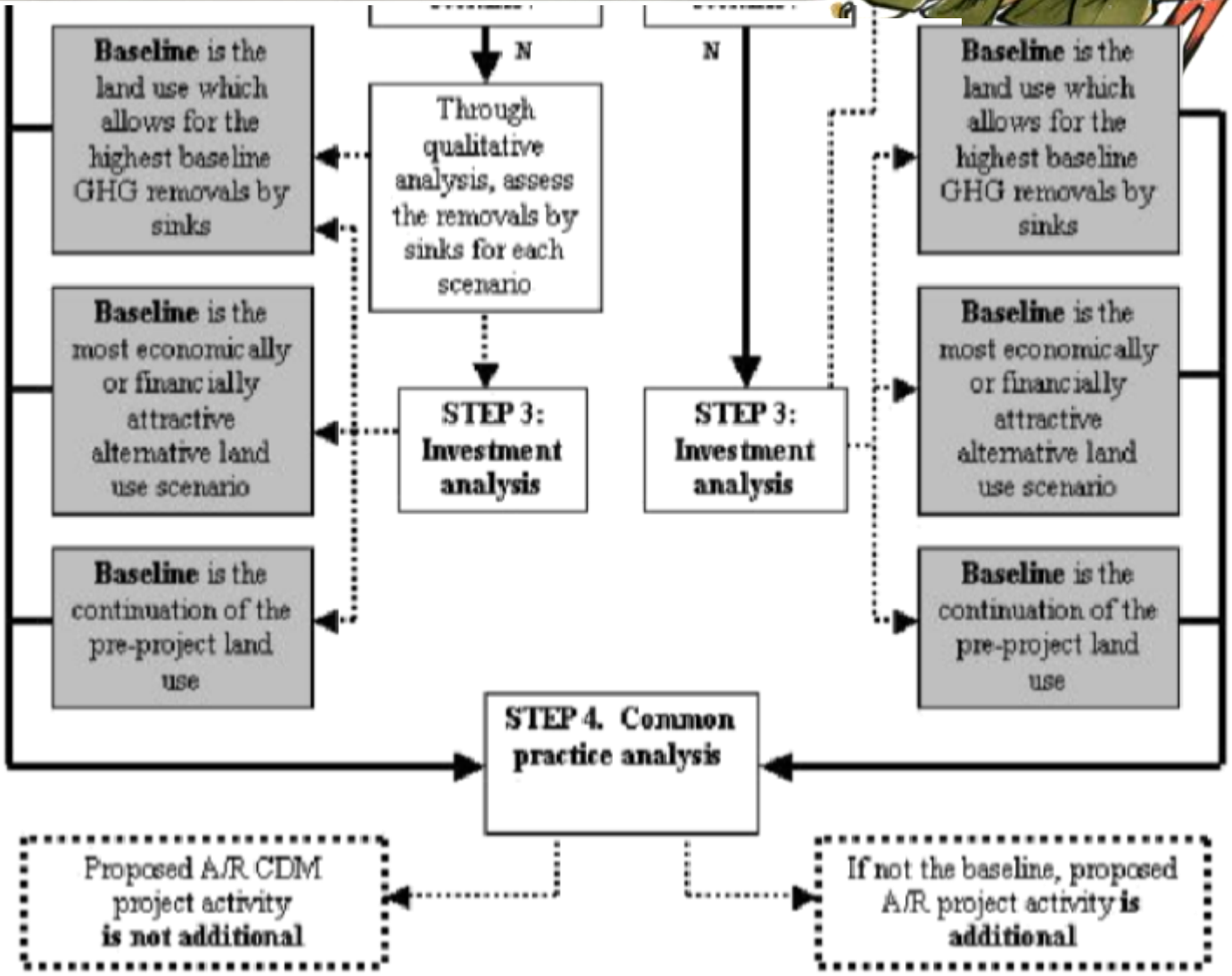
Example: EB 35 annex 19

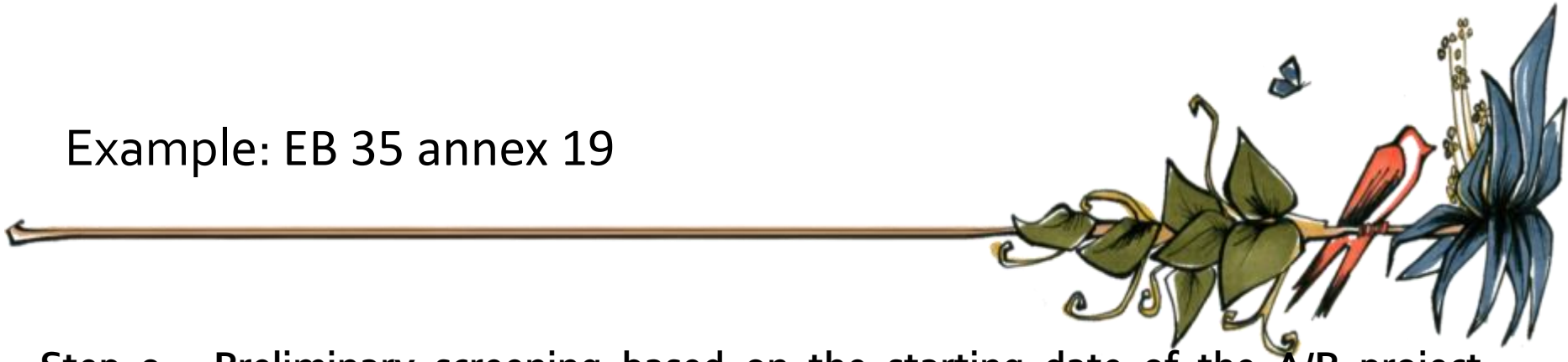
Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities



Example: EB 35 annex 19



Example: EB 35 annex 19



Step 0 - Preliminary screening based on the starting date of the A/R project activity: Provide evidence that the starting date of the A/R CDM project activity was after 31 December 1989, and that the incentive from the planned sale of CERs was seriously considered in the decision to proceed with the project activity.

Step 1 - Identification of alternative land use scenarios to the proposed A/R CDM project activity: pre-project land use, afforestation without CDM, other, being I compliance with mandatory legislation and regulations**.**

Step 2 - Barrier analysis: the CDM help to solution project barriers (Investment barriers, other than insufficient financial returns, institutional and technical barriers, prevailing practice, tradition, local ecological conditions, social conditions, land tenure…).

-> The baseline scenario defined after this step

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Example: EB 35 annex 19

Step 3 - Investment analysis: Identification of the most economically and/or financially attractive land use scenario within the boundary of the proposed A/R CDM project area.

Step 4 – Common practice analysis: no similar activities can be observed or essential distinctions between the proposed CDM project activity and similar activities can be made

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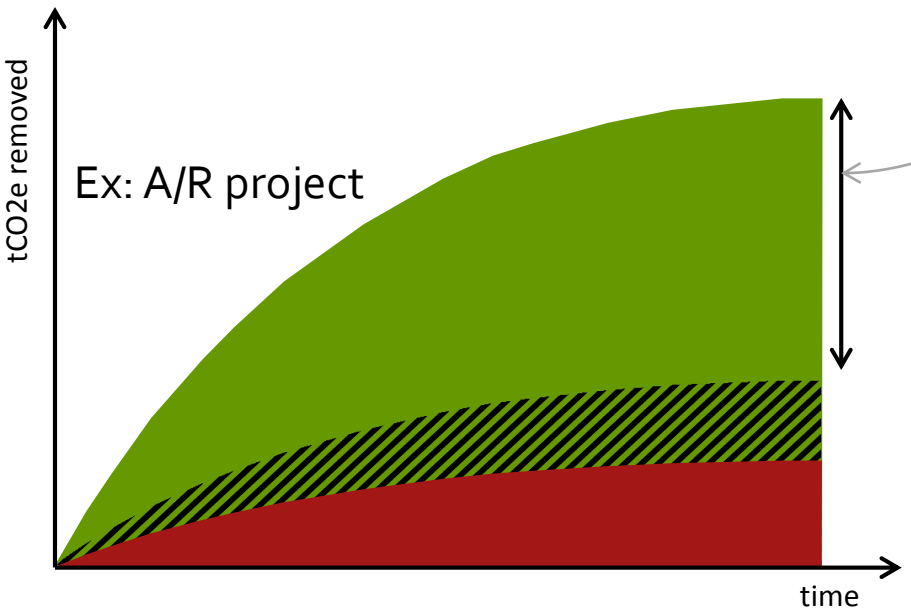
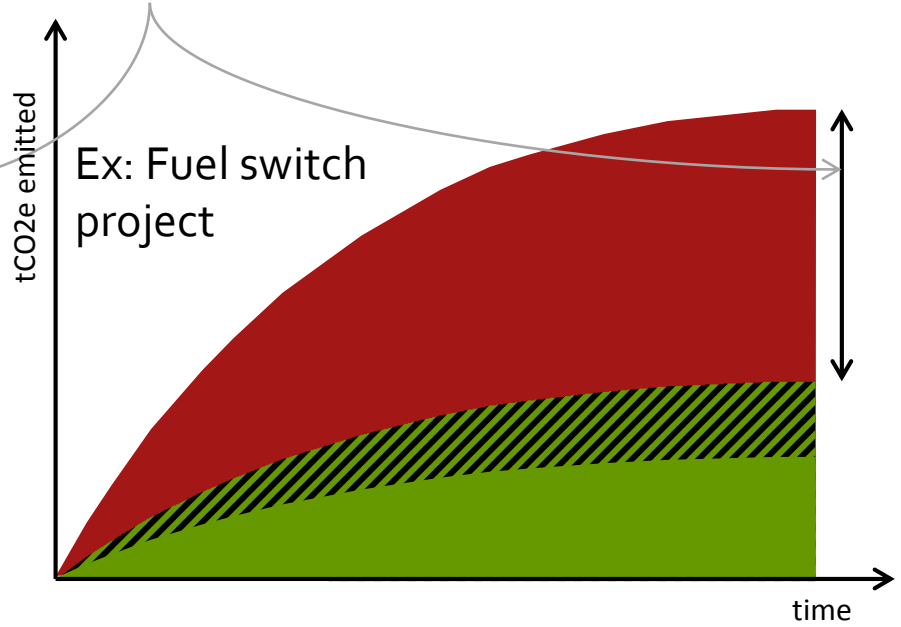
Principle

Carbon benefits: emissions reductions or removals increase





Emissions / removals in the baseline scenario

Emissions / removals in the project scenario

Leakage

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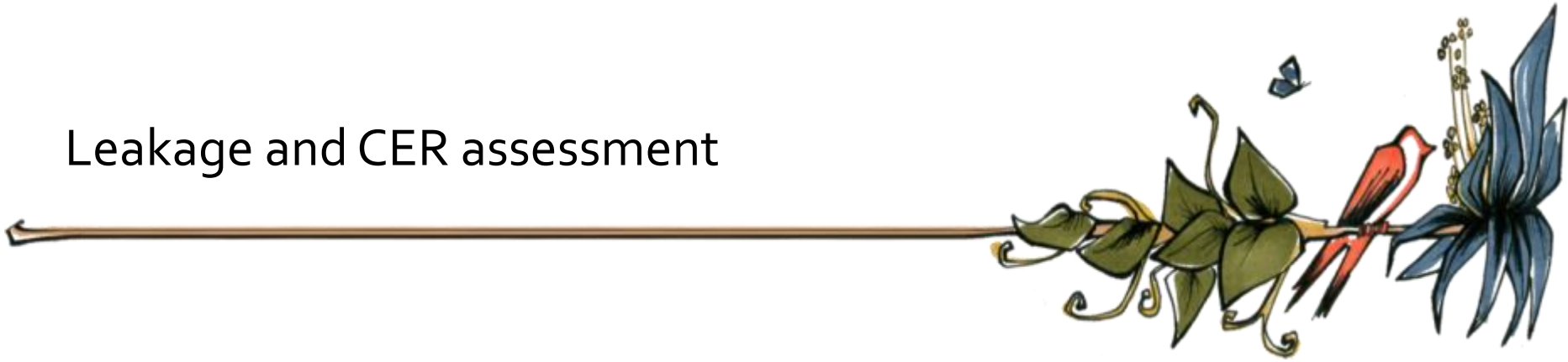
Leakage and CER assessment



Leakage is the increase in GHG emissions by sources which occurs outside the project boundary due to the CDM project activity and which is measurable

Types of leakage: Activity displacement and Demand/supply displacement

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Principle

Project monitoring is compulsory to prove effective carbon storage or avoided GHG emissions and get carbon credits

Monitoring procedures are set up at the beginning, according to methodology

Project monitoring is conducted on an ongoing basis, depending on project types

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Monitoring of an A/R project

- Estimate the **above-ground and below-ground carbon pools** from common measurable data:
  - tree height and diameter
  - wood density
- It requires **sample plots**
- Need of **allometric equations** based on:
  - default values from IPCC (may not be adapted, often very conservative)
  - existing references
  - otherwise, determine equations specific to the project

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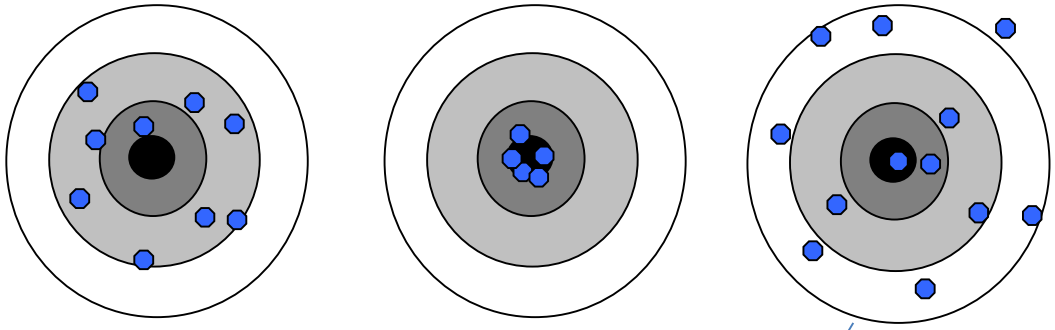
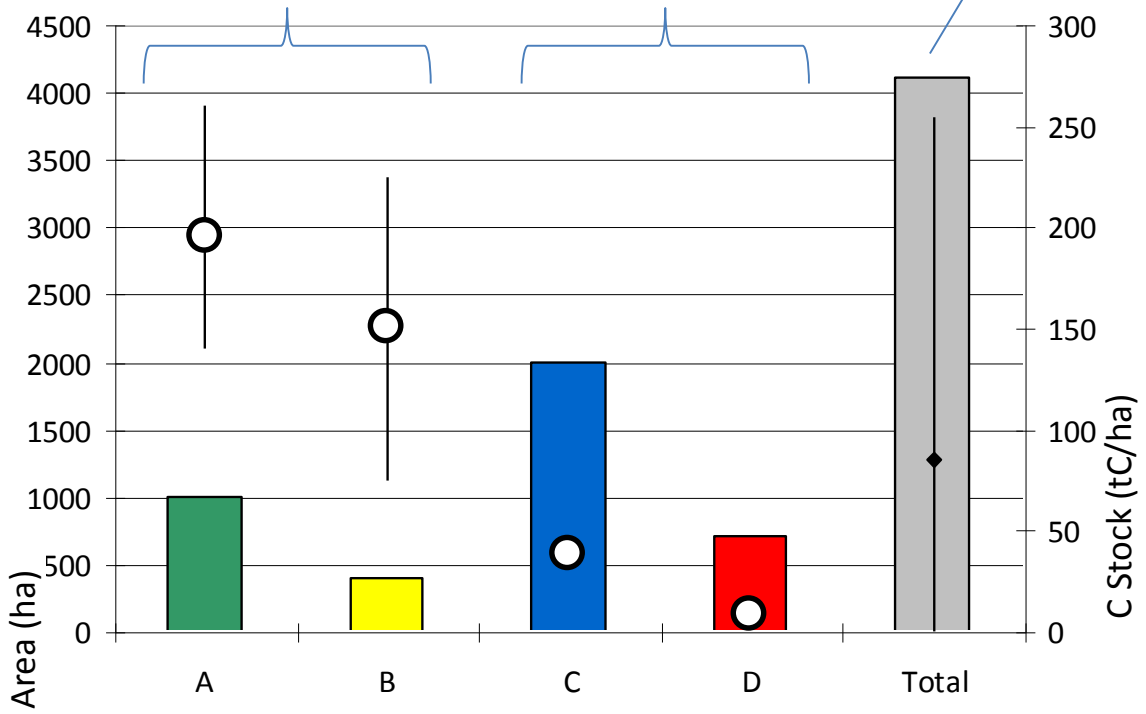
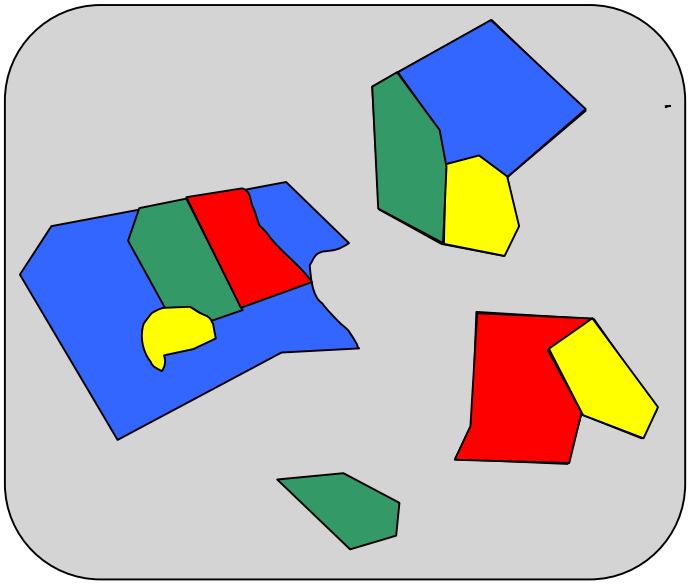
Stratification reduces sampling effort and increases accuracy



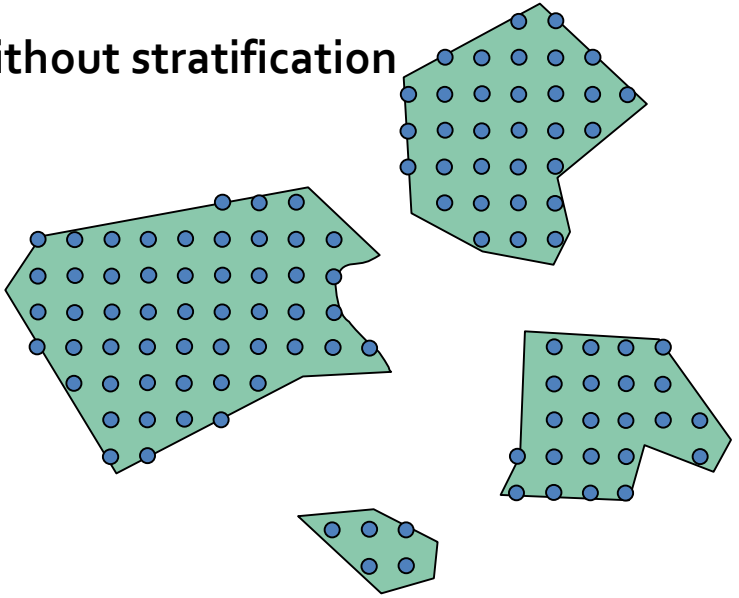




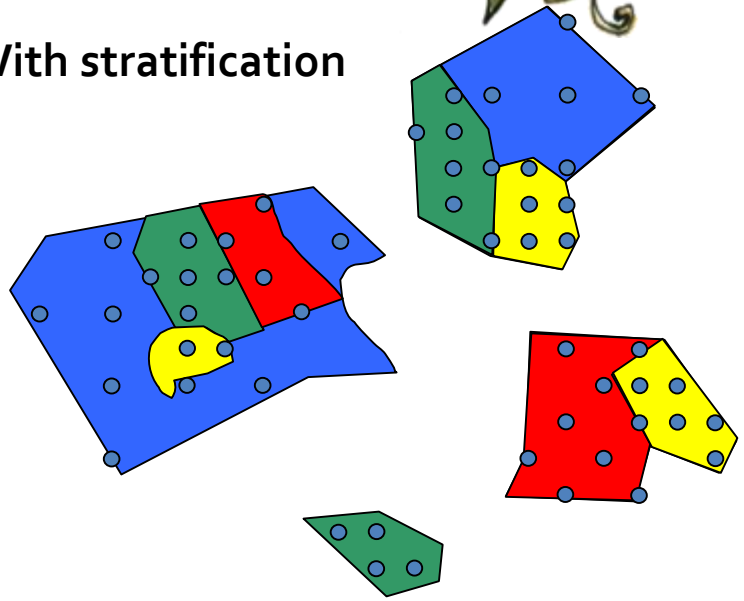
Project area

Stratification reduces sampling effort and increases accuracy

Without stratification



With stratification



Stratification criteria: plantation densities, species, soils conditions, etc.

Sampling

Tools approved by IPCC, eg EB 31: Calculation of the number of sample plots for measurements within A/R CDM project activities

Around 30 sample plots per strata

Try to have around 20 trees per plot

Number of plots = f (forest heterogeneity, targeted error and level of confidence)

Permanent plots can be imposed by the methodologies (e.g. AMS0003)

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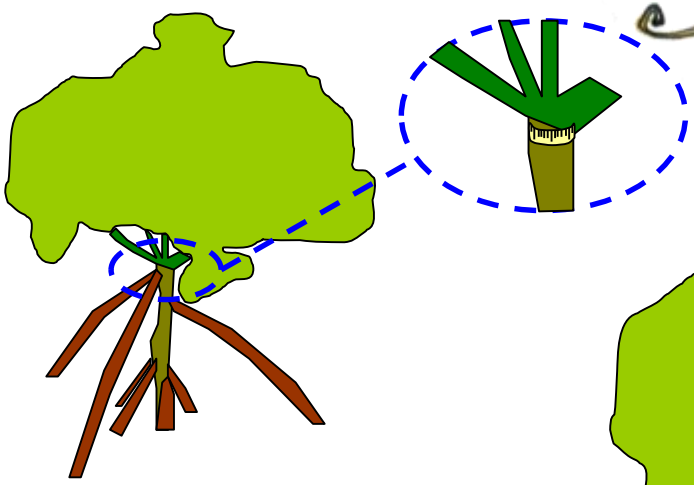
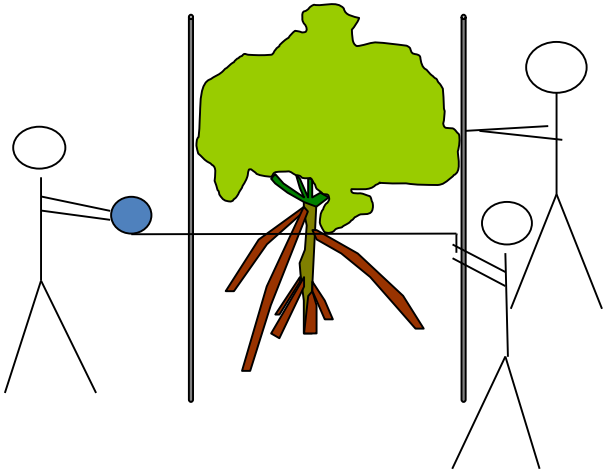
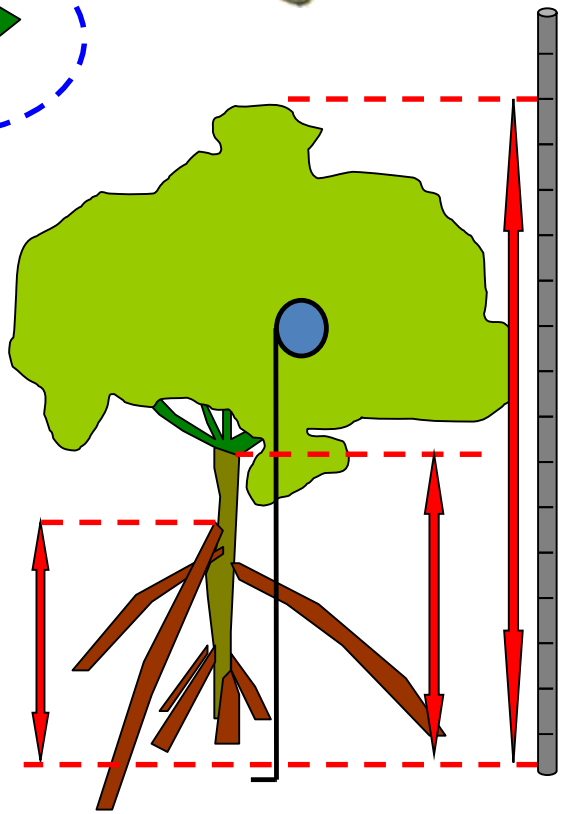
Data collection







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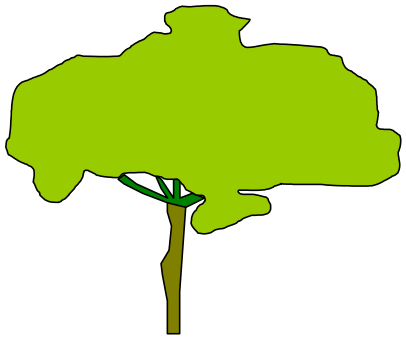
From measures to biomass assessment



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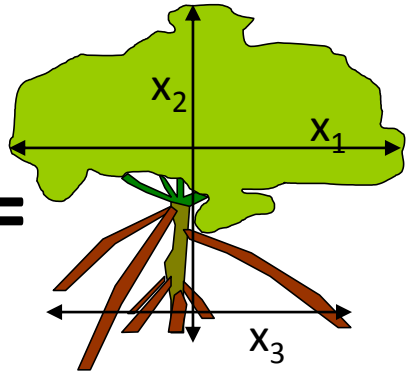
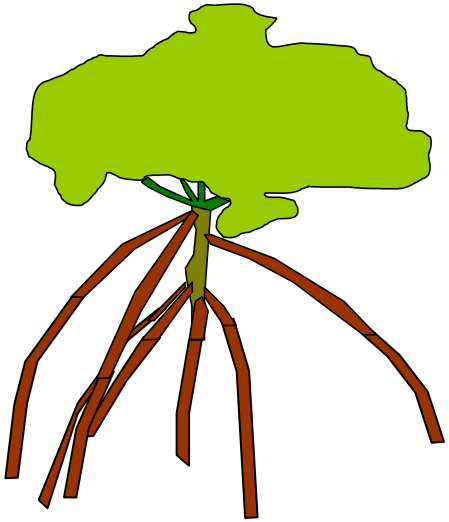


+ $y = ax_1^2 + b\ln(x_2) + ce^{x_3} + \ldots$

allometric equation



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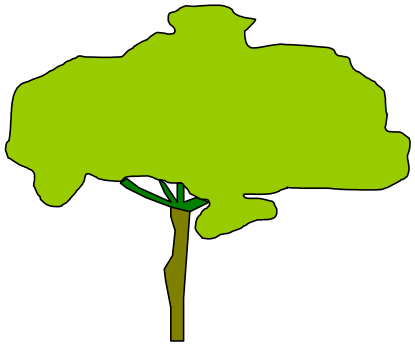

x (1+R)

Root to shoot ratio

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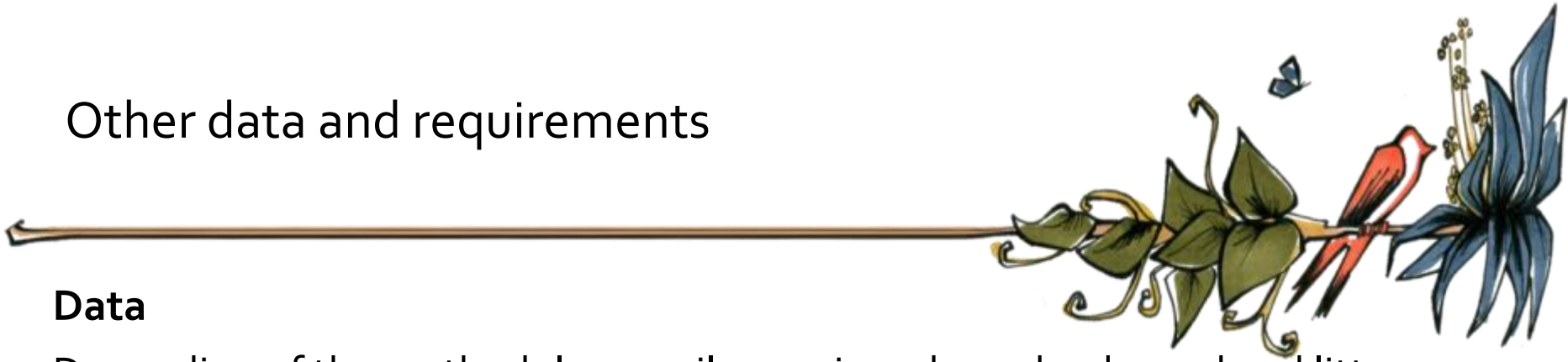
Other data and requirements



Data

Depending of the methodology, soil organic carbon, dead wood and litter

Report on forest management activities (date, duration, material, etc.)

Fuel consumption?

Nitrogen fertilization?

Livestock ? (number, duration in parcel, etc.)

…

Requirements

All about accuracy, conservativeness and transparency

Include uncertainty analysis

Quality assurance and quality control plan required. QA/QC plan should cover: data collection, data gathering (into a database), data treatment, and data maintenance and archiving.

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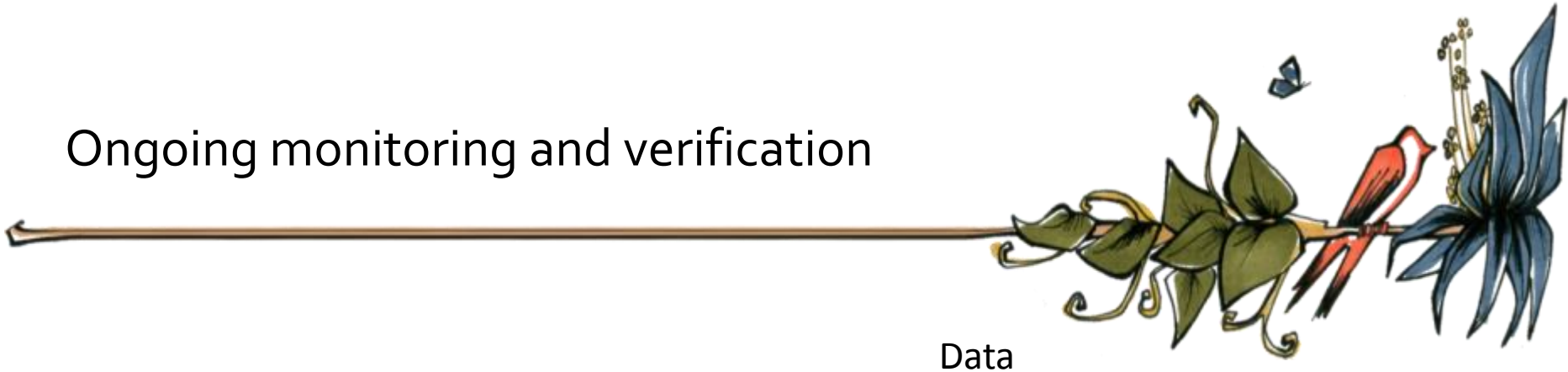
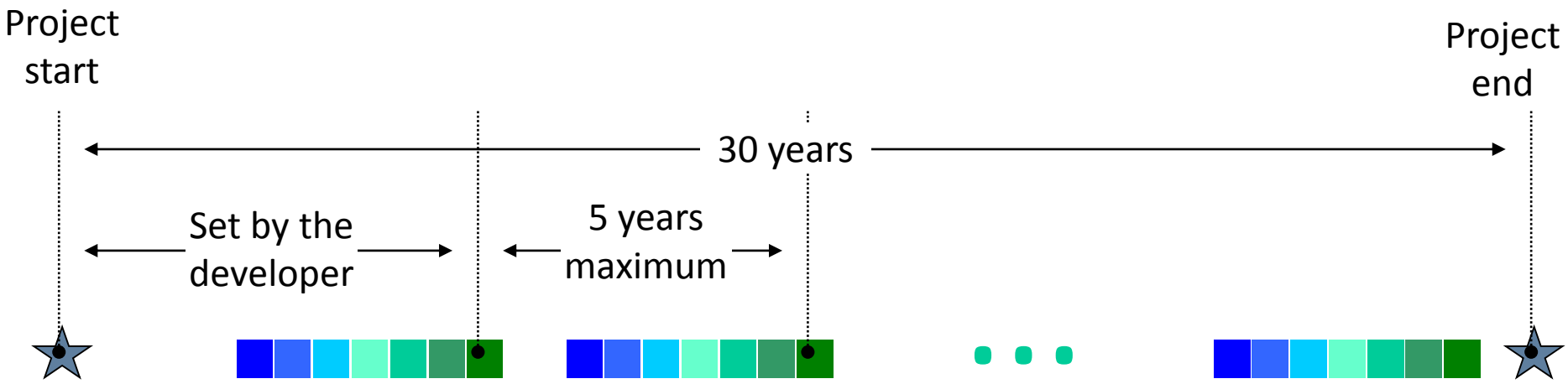
Ongoing monitoring and verification





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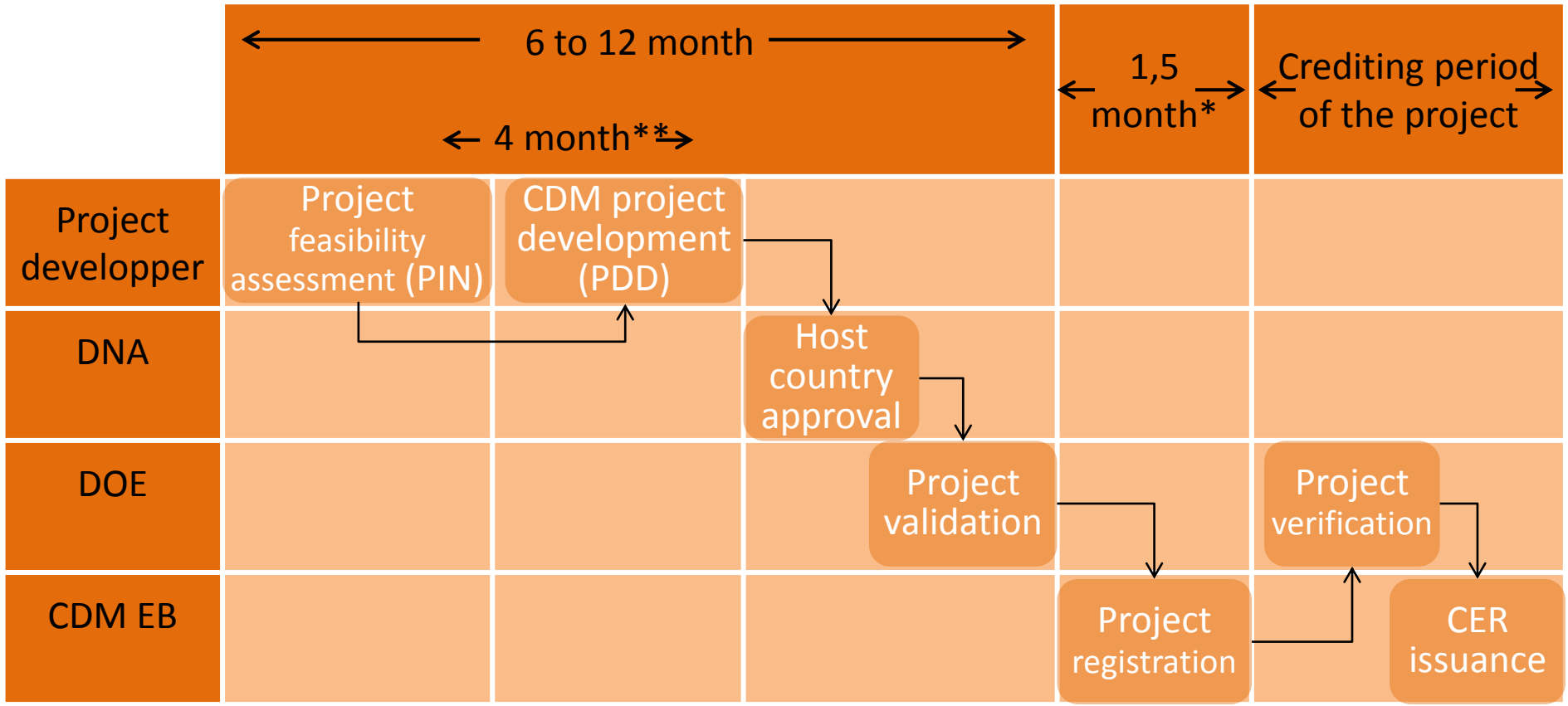
Project cycle



* can be extended depending on the EB decision

** for each submission and additional to normal process

Source : UNEP, 2007

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Main bodies

The CDM **project developer** is the entity responsible for driving the project through the CDM project cycle. The project host (providing the land, facilities or resources) may take on this role, or it may be provided by a company specialised in CDM development.

The **Designated National Authority (DNA)** of the developing country in which the project is located is required to authorize the project (by issuing a Letter of Approval) prior to validation.

The **Designated Operational Entity (DOE)** is required to validate the project prior to registration as a CDM project, and to verify the emission reductions of a project prior to issuance of CERs. Essentially, it plays the role of independent auditor.

The **CDM Executive Board (EB)** is responsible for administering the procedures relating to the registration of projects and issuance of CERs.

Main steps (1/3)

Feasibility assessment: prior short study to assess whether or not the project is feasible. The Project Idea Note (PIN) is helpful to:

- Identify and seek sources of funding
- Obtain a letter of non objection from the host country (DNA)
- Choose an appropriate methodology
- Select a DOE

The **project development step** must result in a Project Design Document describing the activities, the participants and all aspects presented in the "Methodological aspects "section of this presentation.

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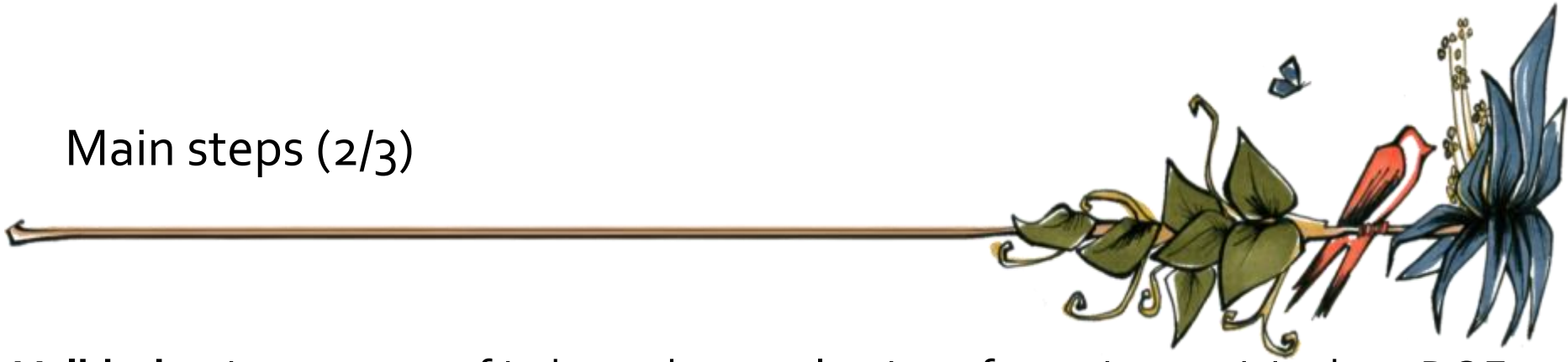
Main steps (2/3)



Validation is a process of independent evaluation of a project activity by a DOE following the CDM requirements, on the basis of the Project Design Document (PDD). Validation is a result of the review of each methodological aspects of the PDD, as well as the approval of the host country and the public consultation process.

Registration is the formal acceptance by the Executive Board of a validated project as a CDM project activity.

Verification is the periodic independent review and ex post determination by the DOE of the monitored reductions in anthropogenic GHG emissions that have occurred as a result of a registered CDM project activity during the verification period.

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Main steps (3/3)

Certification is the written assurance by the DOE that the project activity result in emission reductions or carbon storage.

Issuance of credits is requested the Executive Board based on the certification report.

The Executive Board established and maintains a **CDM registry** to ensure the accurate accounting of the issuance, holding, transfer, acquisition and **cancellation** of CERs by Parties not included in Annex I.

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Programs of Activities (Poa)

The aim of **PoA**s was to allow replicable projects with low and physically spread GHG reductions (too small projects to pay back the transaction cost) into the CDM. **It was expected to allow African countries for a higher participation in the CDM**.

- The PoA level provides the organizational structure governing the eligibility, operation, monitoring and crediting of individual CDM project activities.

- The CDM project activities level consists of individual specific measures through which emission reductions are generated.

Multiple activities can be included under a PoA at the time of registration and additional activities can be added at any point in the life of the PoA, without undertaking the validation process afresh.

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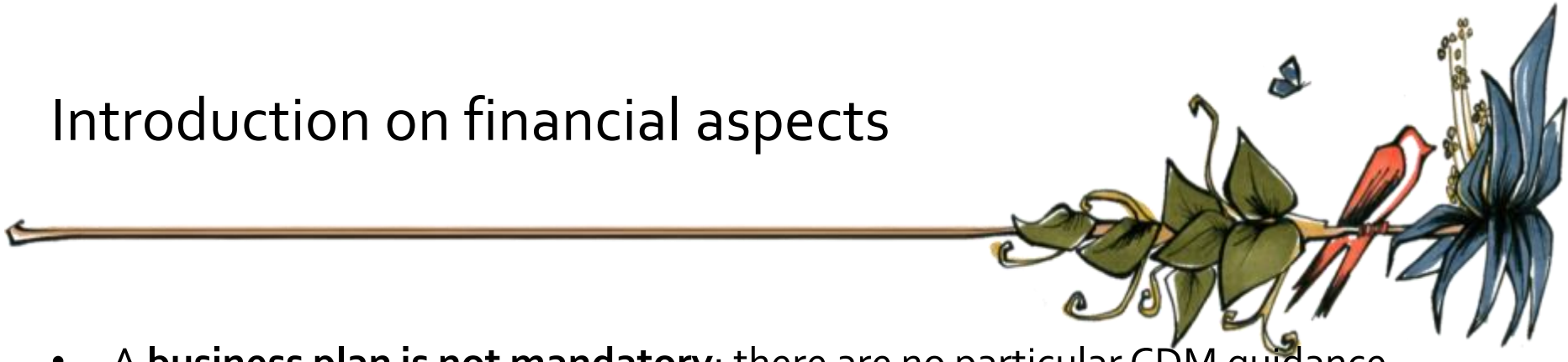
Introduction on financial aspects



- A **business plan is not mandatory**: there are no particular CDM guidance.
- However, a BP is **strongly recommended** !
  - To help demonstrate financial additionality: comparison of IRR – *Internal Return Rate* - with/without project,
  - To calculate <u>precisely</u> the **project costs**:
    - If underestimated: the results will be lower than expected
    - If overestimated: the project won't be attractive (not efficient)
  - To <u>estimate</u> the **project revenues** :
    - A/R projects produce wood, NLFP, agricultural products, environmental services… **not only carbon !**
    - Need a thorough assessment to design an equitable **benefit sharing mechanism**
    - A/R CDM projects based solely on carbon revenues have been fragilised by low carbon prices… carbon is a **« plus »** but no gold mine !

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The costs of CDM A/R project

- In any project, costs can be divided in two broad categories:
  - **Running costs**: *also called Operating expenditures (OPEX) in the accountancy vocabulary*
    - Labor, raw material,
    - water, gas, electricity, paper, communication, insurance, etc.
    - Services: subcontracting, equipment rental
  - **Investment costs**: *also called Capital expenditures (CAPEX) in the accountancy vocabulary*
    - Purchase of equipment: cars, tractors, buildings, land etc.
    - Equipment upgrade…
  - There are many rules and implications in terms of **accountability** (assets-liabilities balance) but it is not the purpose of this presentation… ***Usually used in the private sector.***
  - **Categorization** is helpful when preparing a business plan. A checklist avoids missing any important component.
  - **« Carbon transaction costs » : costs involved to develop the carbon component of a project** (see next page). It can be considered as an OPEX (although some experts think it can be considered as a CAPEX because it can help extend the life of an existing asset, the forest…).

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Carbon transaction costs (1/2)

	LSC (USD)	SSC (USD)
Initial feasibility study, i.e. Project Idea Note (PIN)	5,000–30,000	2,000–7,500
Project Design Document (PDD)	15,000–100,000	10,000–25,000
New methodology (if required)	20,000–100,000 (incl. US$1,000 UN registration fee)	20,000–50,000

Source: CD4CDM, 2007

Costs associated to the CDM "certification standard"

- The project developer is responsible for the conception of his/her project (PIN & PDD).
- The developer can produce these documents internally if he has sufficient resources:
  - technical skills, human resources, time and financial resources
- But most of the project developers call for external assistance **because CDM modalities and procedures are complex.**
- Transaction costs linked to Project conception and development & PDD elaboration depends mainly on the type/duration of external assistance needed.
- **There are no specific CDM guidance. It is rather a negotiation between the project developer and the specialists hired for these tasks.**

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Carbon transaction costs (2/2)

	LSC (USD)	SSC (USD)
Validation	8,000–30,000	6,500–10,000
Registration fee (advance on SOP-Admin – see below)	10,500–350,000[1]	0–24,500[2]
UN Adaptation Fund Fee	2% of CERs	2% of CERs
Initial verification (incl. system check)	5,000–30,000	5,000–15,000
Ongoing verification (periodically)	5,000–25,000	5,000–10,000

Source: CD4CDM, 2007

- The DOE costs for **validation and CER verification/certification** (expertise) are less subject to variations because (i) auditing procedures are well defined, (ii) it is a control procedure, no additional data is created.

- The **registration costs and credits issuance costs** are fixed by the EC-UNFCCC (depend on project's scale - see decision EB36 Annex21 Ver 1.0 for more guidance on A/R CDM projects).

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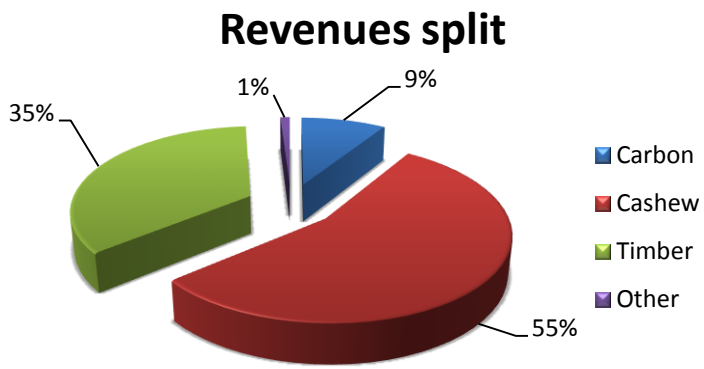
Carbon and other revenues (1/2)

- For A/R CDM projects, carbon revenues are low in comparison with other potential revenues, **especially wood and agricultural products** (in agroforestry systems). These alternative revenues have often been neglected due to high expectations on carbon prices…



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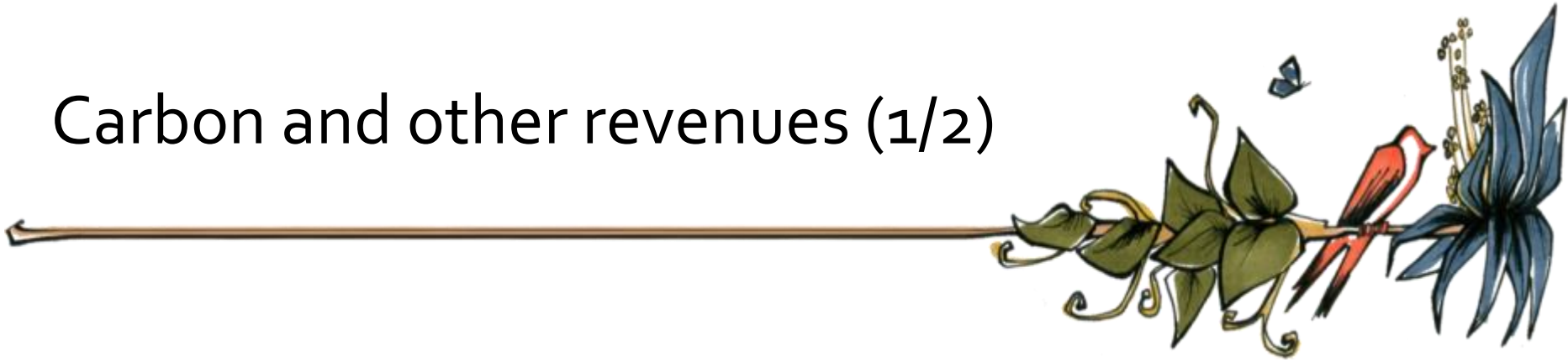
Carbon and other revenues (1/2)



- Expected carbon revenues must be compared to the transaction costs to assess the **financial opportunity** of developing a carbon component (making assumptions on the future of the carbon markets).
  - **Methodologies have an impact on the total CER expected, thus on the total carbon revenues. This must not be neglected !**

- Moreover, carbon revenues are mid- to long-term cash flows (except in case of up-front payments – see next page) whereas short term cash is needed to start a project… **How to fulfill this financing gap to start activities** ?
  - Internal sources: auto-investment (e.g. incomes from agricultural products)
  - External sources: financial institutions (public or private), funds and/or « traditional » fund raising…

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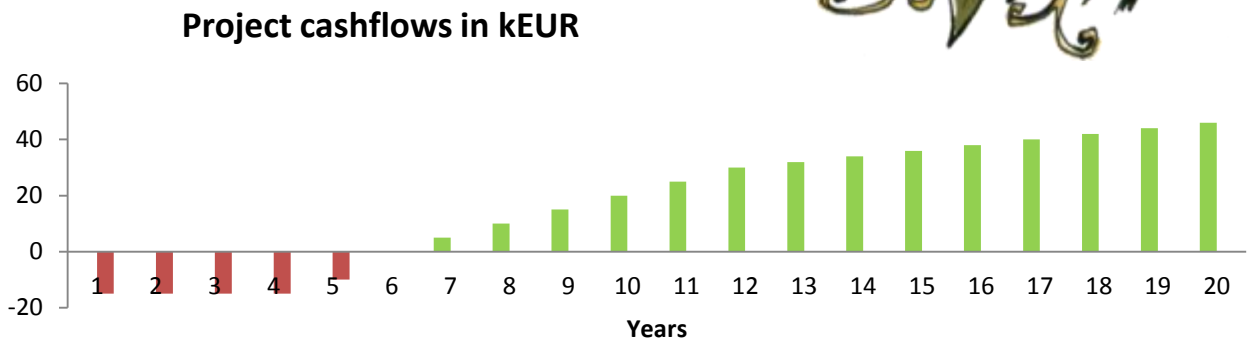
Project financing options (1/2)

How to finance these initial costs ?



At least 3 financing options, generally mixed:

- **Up-front payments through « ERPA »** (*Emission Reduction Purchase Agreement* for verified offsets – see next page): the seller commits to deliver a certain amount of credits after a given period in exchange of money to start the project.
- **Grants:** no reimbursement required, but monitoring procedures to ensure the project's compliance with the donor's objectives (or logical framework).
  - **FCPF, BioCF, UNEP, GCCA-Intra ACP UE…**
- **Loans:** reimbursement required + interests. Usually provided by banks. But less frequent for CDM A/R projects.

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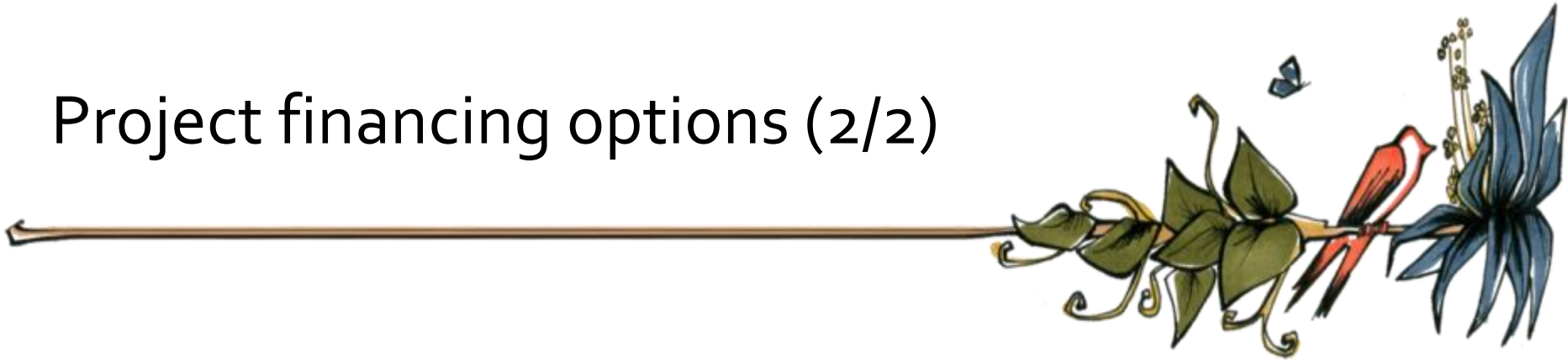
Project financing options (2/2)



Most of forest carbon contracts are **promises to purchase credits in the future**, and take the form of **Emission Reductions Purchase Agreement** (ERPA).

There are standard contracts (World Bank, National carbon funds, International Emissions Trading Association, etc.) each being specific (generally suitable to the buyer).

But **each contract is unique** in that it relates to a specific project, takes into account its features, as well as commercial and non-commercial risks specific to the host country.

Spot	Future contract	« Equity » Capital investment
• CER have been emitted • Few risks • High price	• CER have not been emitted • Higher risks • Lower price	• Risks shared between participants and investors • Attribution of a negociated part of the credits to the investor

Project financing options (3/3)

Contractual provisions for ERPA

- Preamble
- Identification and representation of Parties
- Subject: sale of CDM credits
- Nature of the goods sold: legal nature
- Quantity of goods sold + purchase option
- Price (fixed or variable indexed on the market)
- Transfer of title to the buyer
- Payment conditions and delivery dates

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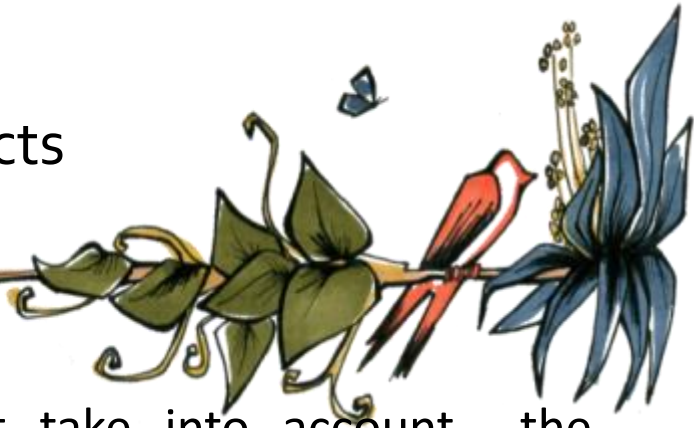
Safeguards on socio-environmental impacts limited to national tools



Decision 5/CMP.1* specifies how projects must take into account the environmental and social impacts.

CDM project developers must provide the DOE documentation on the analysis of socio -economic and environmental impacts, including impacts outside the project area. The analysis should include, if possible, information on hydrology, soils, risk of fires, diseases, etc.

If negative impacts are considered significant, the project must complete a Environmental and social impact assessment in accordance with the procedures required by the country where the project is located. The PDD must include a description of the monitoring plan and measures to limit impacts.

**Modalities and procedures for afforestation and reforestation project activities under the CDM in the first commitment period of the KP*

Contents

1. Forests and climate change
2. Forests and the UNFCCC
3. Overview of the CDM
4. Forests in the CDM
5. Methodological aspects
6. Project cycle and organization
7. Financial aspects
8. Socio-environmental aspects
9. Carbon ownership

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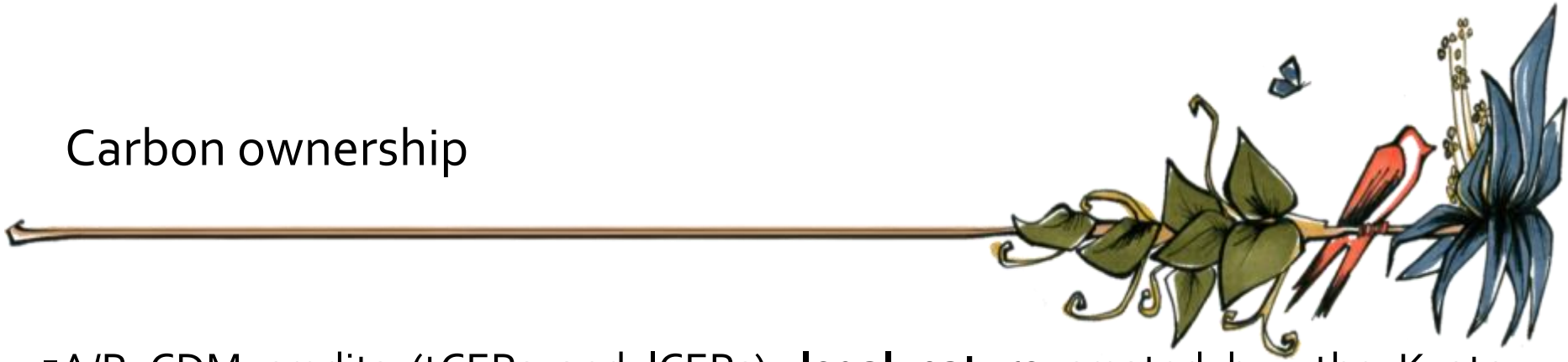
Carbon ownership



- A/R CDM credits (tCERs and lCERs): **legal nature** created by the Kyoto Protocol (Decisions 19/CP.9 for AR and 14/CP.10 for Small scale AR).

- But the UNFCCC regulates relations between States **and not between actors within these States.**

- Credits are generated for the "**Project participants**" = people defined as participants in the Project Design Document (PDD).

- Projects (and PDD) **has to be endorsed** by the host government.

- **Each State** and project proponent has to establish the rules of distribution of profits from the sale of credits.

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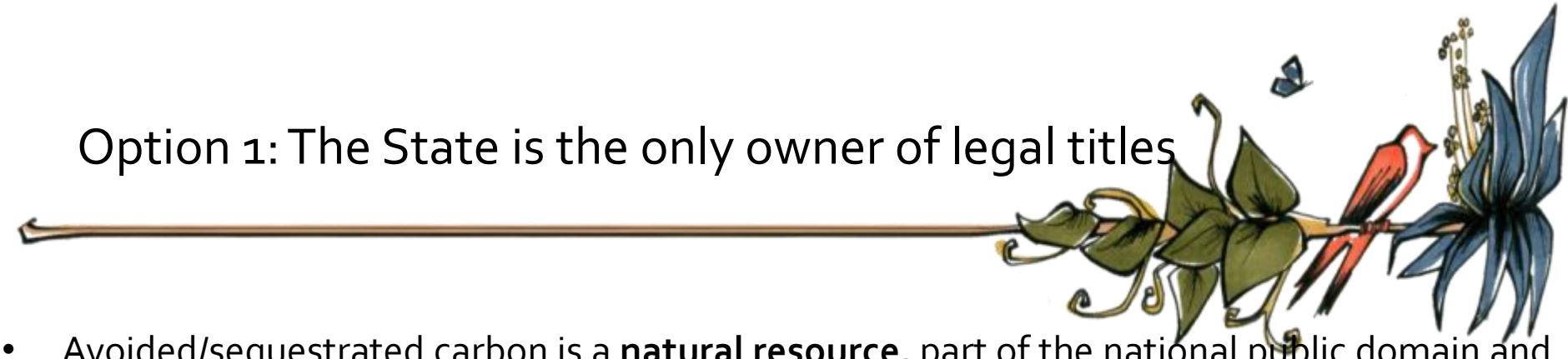
Option 1: The State is the only owner of legal titles



- Avoided/sequestrated carbon is a **natural resource,** part of the national public domain and heritage. **Regardless of tenure or access rights to forest resources,** the State has **full ownership** over sequestrated/avoided carbon, **sole holder of a title potentially transferable**

- …But, it **does not exclude** the possibility of granting this authority to **local authorities,** decentralized entities of the State (as it is the case in Kenya, under devolution process).

- This is for instance the option selected by **New Zealand** in 2002 for the so-called "Kyoto forests" (planted after 1990), by considering the sequestrated carbon as a **public asset**.

- The law would also **specify the distribution mechanisms of carbon revenues** to all entities **directly/indirectly involved** in the implementation of activities (regardless of whether the activities are **regulated** or under a **voluntary market mechanism**)

- Such people include **landowners** or **holders of access rights** (including customary rights)

Option 2: Ownership of CDM rights is proportionate to efforts

- Sequestrated/avoided carbon can be viewed as an **industrial or natural asset**…Therefore, the **result** (sequestrated/avoided carbon) is **linked to the service**. Entities **contribute** either **directly** (through material or capital input) or **indirectly** (waiver of their rights to exploit resources) to field activities and therefore to the **provision of this service**.
- The **landowners**, who make the land available for this service, could be considered as the **main beneficiaries**. It is also possible to consider that sequestrated/avoided carbon **cannot be detached from forests**. Therefore, **holders of the usage rights**, including recognized customary rights, could be viewed as the **main beneficiaries**. CDM rights could then be considered as an **intangible personal asset**: it is likely to be the option followed by **African French-speaking countries**, influenced by the Roman Law
- Holder of CDM rights can **transfer** it to a third party **without any public legal constraint**. In addition, it would **not** necessarily **be identified by law**, but potentially **by the parties** in a **transaction** based on several **criteria or indicators** (**specified by law if needed**): tenure rights (incl. customary rights), usage rights, capital or material input contributor, etc.

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Concerns identified at international level

- **No country had clear legislation on what carbon rights are,** why they should be bundled with land & forest rights, or the conditions/prerequisites for acquiring/transferring those rights to the private sector. Without consistent legislation, **private sector CDM actors are reinterpreting land & forest legislation to establish rights over this new commodity**.
- **Sharing mechanisms are often unclear,** suggesting **most benefits accrue to the private sector,** not communities or State. A few countries have introduced project-specific taxation, **most are missing the opportunity to generate revenue** from private sector carbon credits.
- Experience in **logging and other sectors** suggests promised **community benefits may not materialise without binding agreements**.
- Governments need to put a **move from opportunistic to long term legislation** on carbon rights high on strategic development agendas. The private sector experiments cover vast areas and span decades. **Mistakes made today could take generations to put right**.

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Merci pour votre aimable attention !