



# OppCost Training Manual

## Introduction and Overview

**Douglas White**



# Authors and contributors

## *ASB and CGIAR*

**Douglas White, Peter Minang, Brent Swallow, Meine van Noordwijk, Glenn Hyman, Valentina Robiglio, Sandra Velarde, Kurniatun Hairiah, Fahmuddin Agus, Jan Börner, Jim Gockowski**

**(Representing experience in Indonesia, Peru, Brazil, Cameroon)**

***World Bank: Stefano Pagiola***

***World Bank project management, editing and review:***

**Pablo Benitez, Stephanie Tam, Stefano Pagiola, Gerald Kapp**

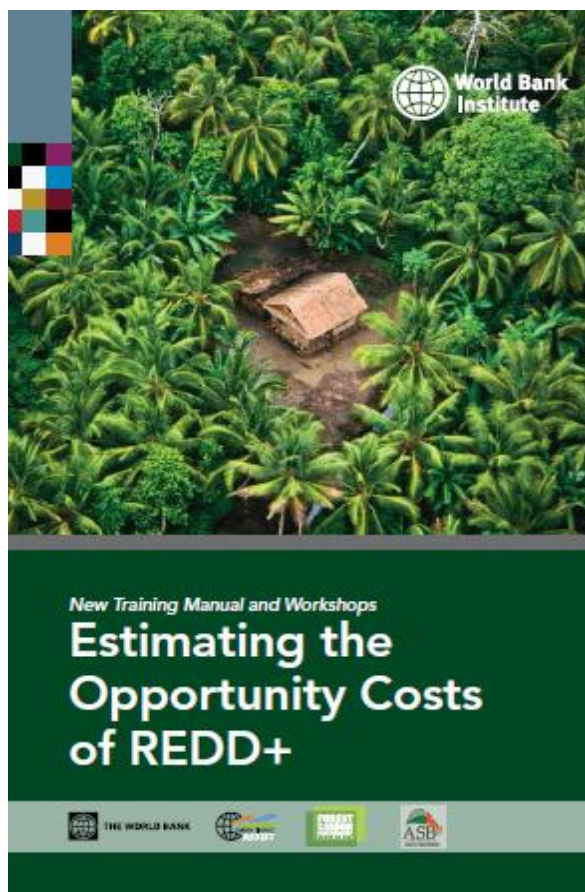


# Presentation Outline

- **Why estimate opportunity costs**
- **What are opportunity costs**
- **When, within the readiness process**
- **Who manual is it for**
- **How: an overview**

# Estimating Opportunity Costs of REDD+

## *A Training manual*

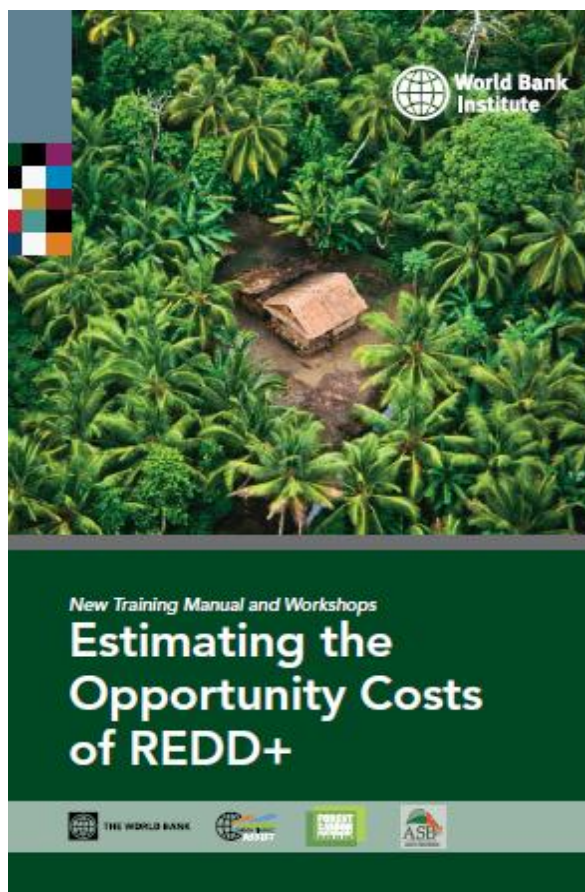


***Why:***

**To generate the economic information needed to help guide decisions for national REDD+ strategies**

# Estimating Opportunity Costs of REDD+

## *A Training manual*

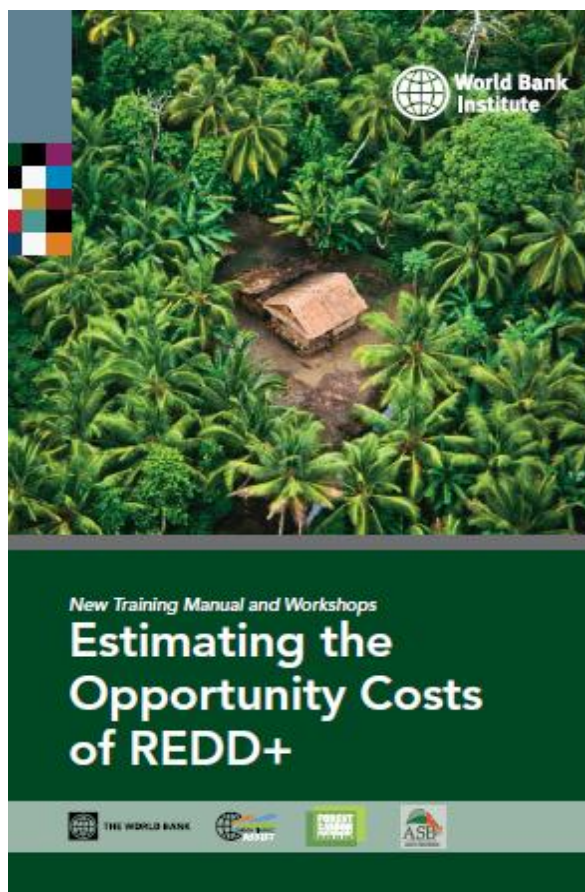


*In other words:*

**To identify which emission abatement options are attractive (financially feasible)**

# Estimating Opportunity Costs of REDD+

## *A Training manual*



***Or simply stated:***

**What does selling our carbon cost us?**

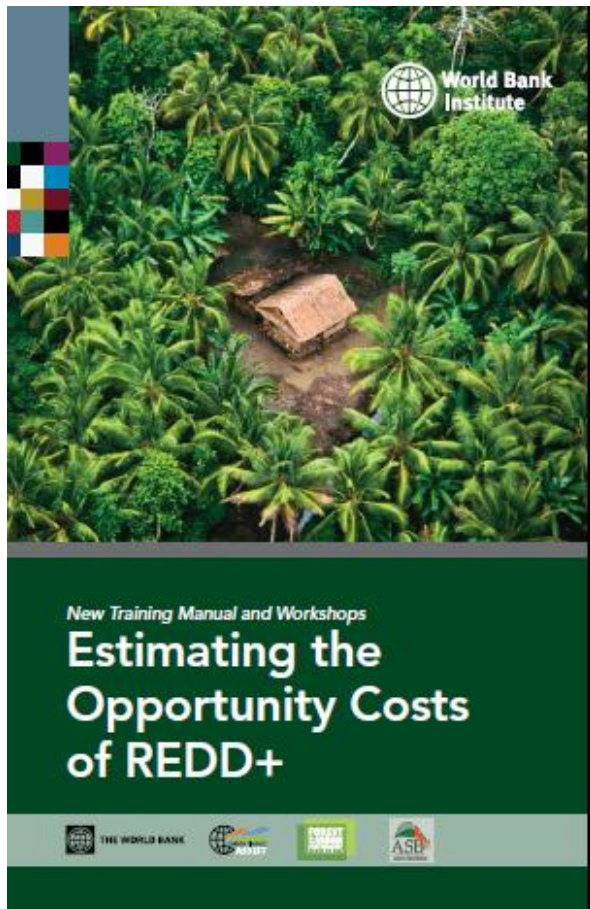
**(also requires implementation and transactions costs)**

# When to do OppCost analysis?

## PHASE 1 Preparation and Readiness



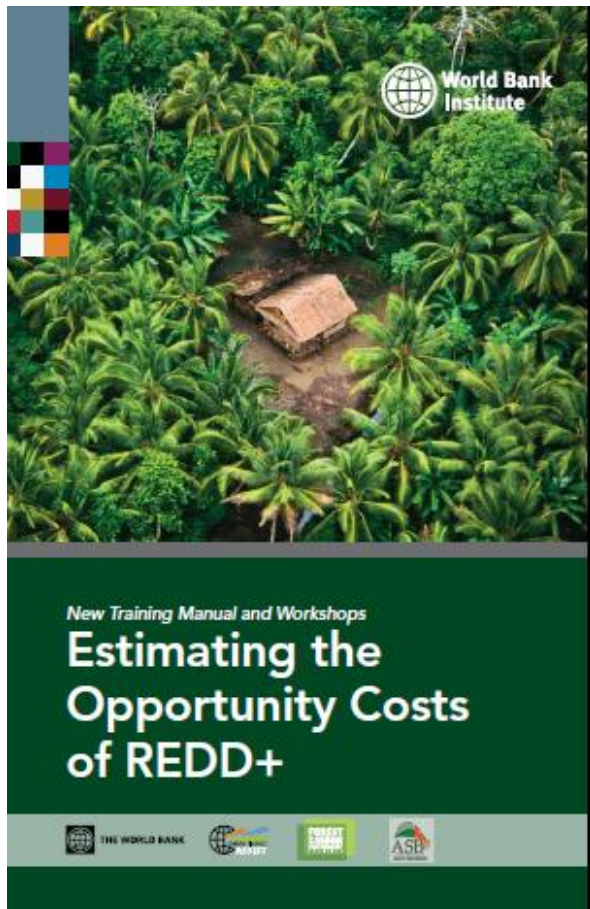
# OppCost training manual objectives



1. To provide methods and tools to estimate the opportunity costs of
  - Forgoing land use changes in forest landscapes (D&D)
  - Enhancing carbon stocks (+)



# OppCost training manual objectives

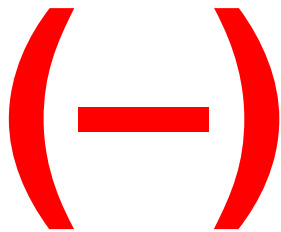


2. To document case study examples that enable professionals (government, university, NGO) to
  - learn, adapt and use analytical methods,
  - interpret results
  - recommend national REDD related policies

# REDD+ Costs & Benefits

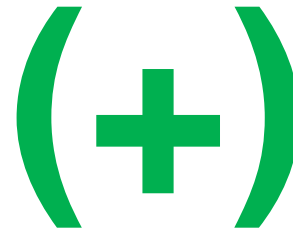
- **Costs**

- Opportunity
- Implementation
- Transactions
- Social and cultural



- **Benefits**

- Compensation (carbon price)
- Co-benefits
  - Water
  - Biodiversity



# REDD+ Costs

- *Direct, on-site*
  - profit difference between conserving forests and conversion to other land uses
  - the difference in profits from increasing carbon within forests or restored forests

Opportunity

# REDD+ Costs

## Opportunity

- *Direct, on-site*
  - profit difference between conserving forests and converting them to other land uses
  - the difference in profits from increasing carbon within forests or of restored forests
- *Socio-cultural*
  - livelihoods restricted or changed
  - psychological, spiritual or emotional impacts
- *Indirect, off-site*
  - difference in value-added activities (changes in economic sectors attributable to REDD+)
  - tax revenue differences
  - agriculture and forest product price increases from economy feedbacks (dynamic not static effects)

## Implementation

- land use planning
- land tenure / governance reform
- forest protection, improved forest & agriculture management
- job training
- administration

## Transaction

- REDD+ program development
- agreement negotiation
- emission reduction certification (MRV)
- Stabilization (stop leakage)

# Who: Diverse skills needed

- ***geographers / spatial analysts***
  - to map land uses and changes
- ***foresters, soil scientists and carbon specialists***
  - to measure carbon in land uses
- ***agricultural and forest economists***
  - to estimate profits of land uses
- ***hydrologists and biodiversity specialists***
  - to estimate possible co-benefits
- ***sociologists***
  - to help identify possible adverse social consequences
- ***national REDD+ administrators***
  - to identify optimal policy actions

# Who: Target audiences & chapter priorities

## *National-level decision makers and planners*

- Introduction
- Overview and preparations
- REDD+ policy context
- Opportunity cost analysis
- Tradeoffs and scenarios
- Conclusions and next steps

# Who: Target audiences & chapter priorities

National-level decision makers and planners

**Practitioners and analytic experts**

– Entire manual

- to enable communication across disciplinary boundaries



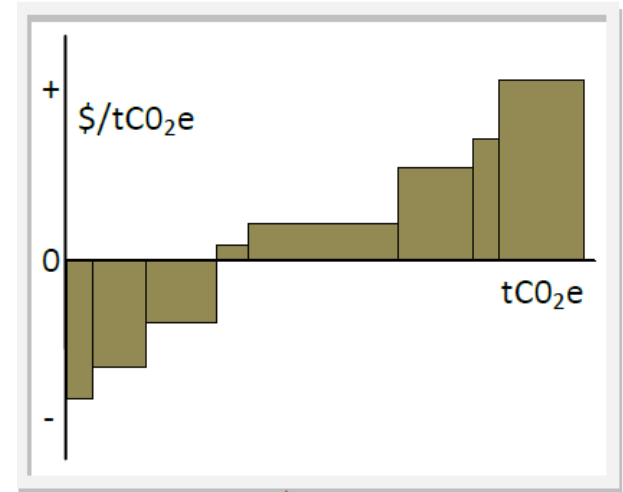
# How much do I already know?

- ***Minimum mapping unit - land use trajectory***
- ***Net present value - accounting stance***
- ***Reference emission level - business as usual***
- ***Carbon flux - allometric equation***



# What is in the OppCost manual?

*Objective:  
cost curve*

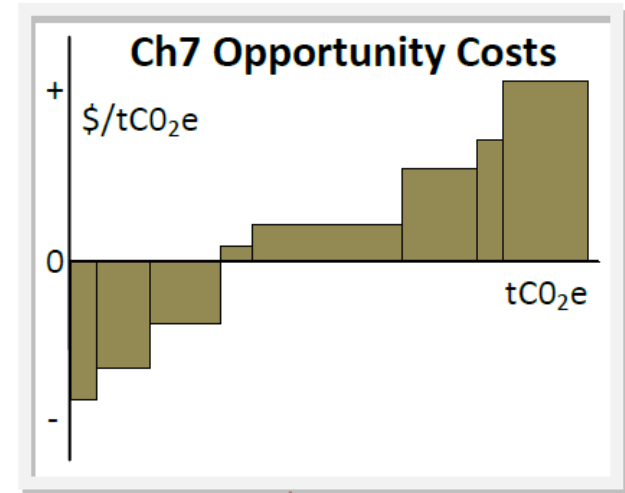




# Chapter 3: REDD+ Context & Policies

- **An evolving REDD+ eligibility policy**
- **Who pays what costs: accounting stance**
- **Reference emission levels**
- **Nationally Appropriate Mitigation Actions (NAMA)**
- **SESAs and safeguard policies of the World Bank**

# What is the OppCost manual?



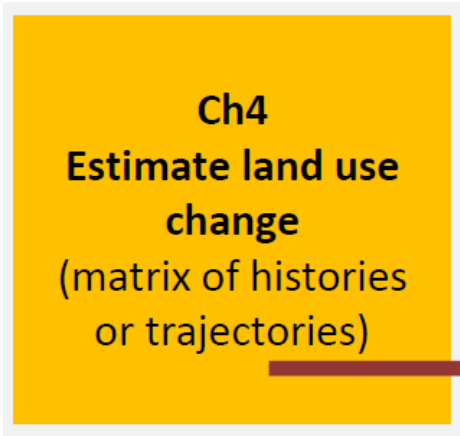
**Analysis based on 3  
types of information**

# Chapter 4: Analyzing Land Use Change

*For the vertical axis:*



*For the horizontal axis:*



- 1. Identify and classify land uses**
  - reconcile land covers & uses
- 2. Estimate changes in land use**
  - learn the history
  - project likely future trajectories
- 3. Explain drivers of change**
  - guide analysis for scenarios of land use change
  - establish reference emission levels
  - policies and actions to achieve emission levels

# Chapter 5: Estimating Carbon Stocks

*For the vertical axis:*

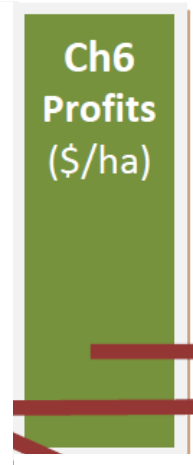
Ch5  
Carbon  
stocks  
(tC/ha)

*Using land use classes:*

1. Design C measurements
2. Measure C in pools
  - Tree biomass
  - Understorey biomass
  - Crop
  - Dead biomass
  - Litter
  - Soil C
3. Estimate time-averaged C

# Chapter 6: Estimating Profitabilities

*For the vertical axis:*

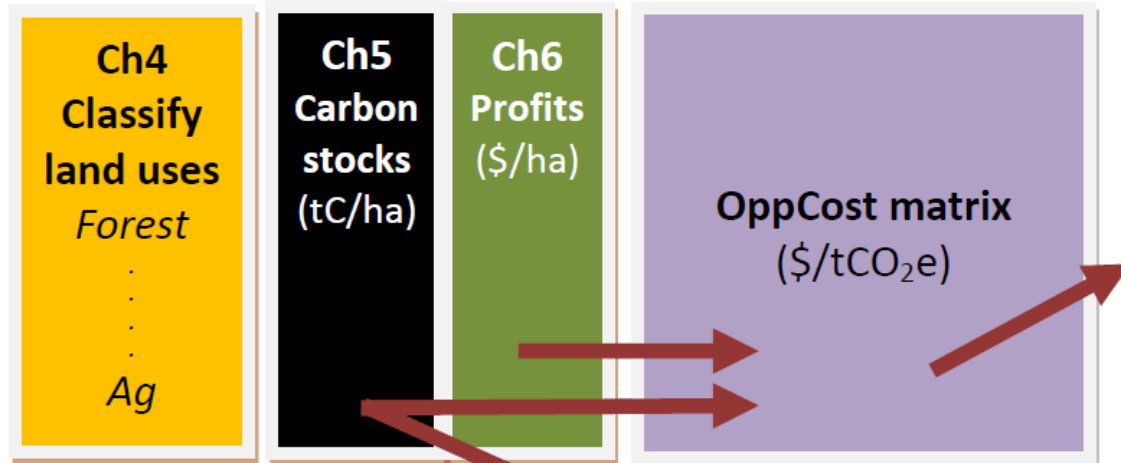


***Using land use classes:***

- 1. Develop activity / enterprise budgets**
  - costs, revenues
- 2. Multi-year analysis**
  - Net Present Values (NPV)
  - Establishment phase
  - Operation phase

# Chapter 7: Generating an OppCost Curve

*For the vertical axis:*



**Two  
matrices  
integrate  
information**

*For the horizontal axis:*





# Chapter 8: Co-Benefits

- **Forest ecosystem services**
  - **Water**
  - **Biodiversity**



# Forest ecosystem services

Ecosystem service	Examples
<i>Provisioning</i>	<i>Production of food and water (the focus of opportunity cost analysis)</i>
Food	Non-timber forest products such as fruits, berries, animals
<b>Water</b>	<b>Water supplies of domestic, industrial and agriculture</b>
Fiber	Timber, hemp, silk, rubber
Fuel	Fuel wood, charcoal
<i>Regulating</i>	<i>Control of natural processes</i>
Climate	Regulation of the global carbon cycle; local and regional climate regulation (albedo effects, regional rainfall etc)
<b>Floods/drought</b>	<b>Reduction of surface water runoff</b>
Disease	Reduced breeding area for some disease vectors and diseases transmission, such as malaria
<b>Water</b>	<b>Hydrological cycle</b>
<i>Cultural</i>	<i>The non-material benefits obtained from ecosystems</i>
Aesthetic	Scenery and landscapes
Spiritual	Spiritual significance to forests
Educational	<b>Genetic resources, biodiversity</b>
Recreational	Tourism
<i>Supporting</i>	<i>Natural processes that maintain other ecosystem services</i>
Nutrient cycling	Nutrient flows through atmosphere, plants and soils
Soil formation	Organic material, soil retention
Pollination	



# Chapter 8: Co-Benefits

- **Forest ecosystem services**
  - Water
  - Biodiversity
- **Although opportunity costs of a forest parcel may be high, significant services may influence policy priorities**

# What do opportunity costs reveal and what not?

- **Retrospective, ground-based analysis**
  - Land use change
  - Carbon
  - Profits
- **Empirical basis for future analysis**
  - Partial equilibrium effects
    - Feedback and multipliers
  - Scenarios
    - Biofuels
    - Energy
    - Prices (food, timber)

# What information is needed to start?

*Whatever you have:*

- **Tier 1: Global data sets (default values)**
- **Tier 2: Representative data sets + default values simple methods**
- **Tier 3: Detailed modeling and highly accurate methods**



# Thank you



REDD+