REDD+ strategy update

STRICTLY CONFIDENTIAL

Presentation to
1 March 2010

Objectives for today

- **Explain PNG's approach to REDD strategy after Copenhagen**

- **Share preliminary findings on greenhouse gas emissions and abatement opportunities**
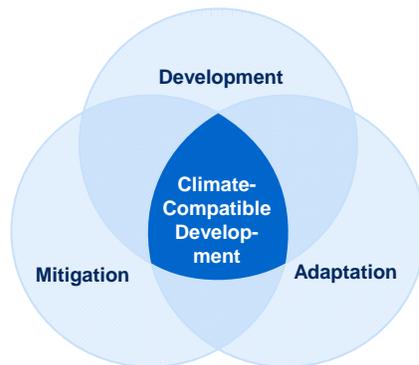
- **Propose next steps**

Contents

| 2

Papua New Guinea's strategy for Climate-Compatible Development has three elements

Strategic framework

Development

Climate-
Compatible
Develop-
ment

Mitigation
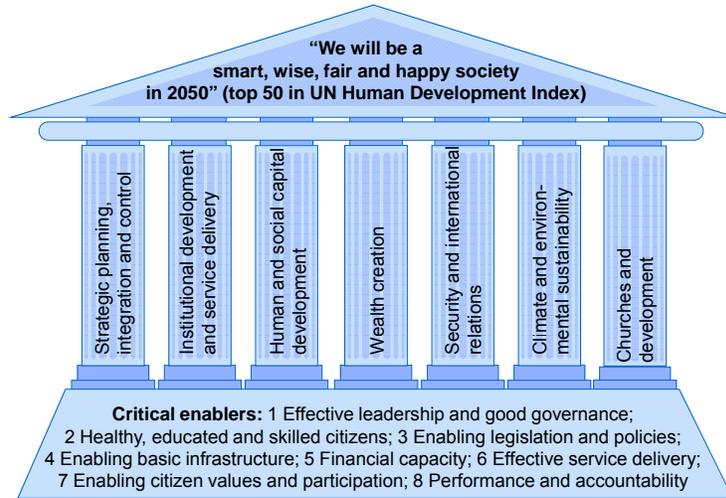
Adaptation

Elements

Economic Development: Achieve GDP per capita of USD 3,000 by 2030, as set out in our Vision 2050, to meet our people's aspirations for a better life.

Mitigation: Reduce emissions of greenhouse gases, by at least 50% by 2030 and 100% by 2050. Over 90% of this reduction will come from Reducing Emissions from Deforestation and Forest Degradation (REDD+), at an average cost of ~USD 4/t.
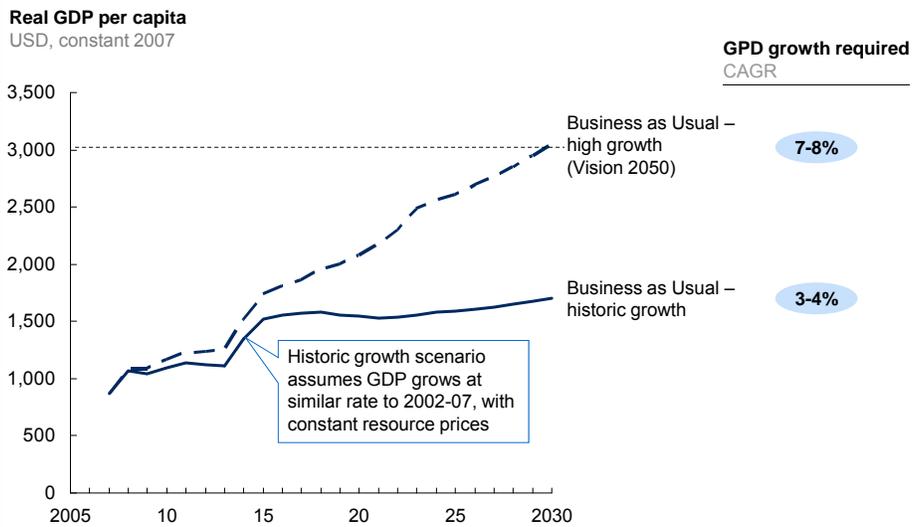
Adaptation: Reduce the vulnerability of Papua New Guineans to the risks associated with climate change, such as coastal and inland flooding, agricultural yield changes and disease.
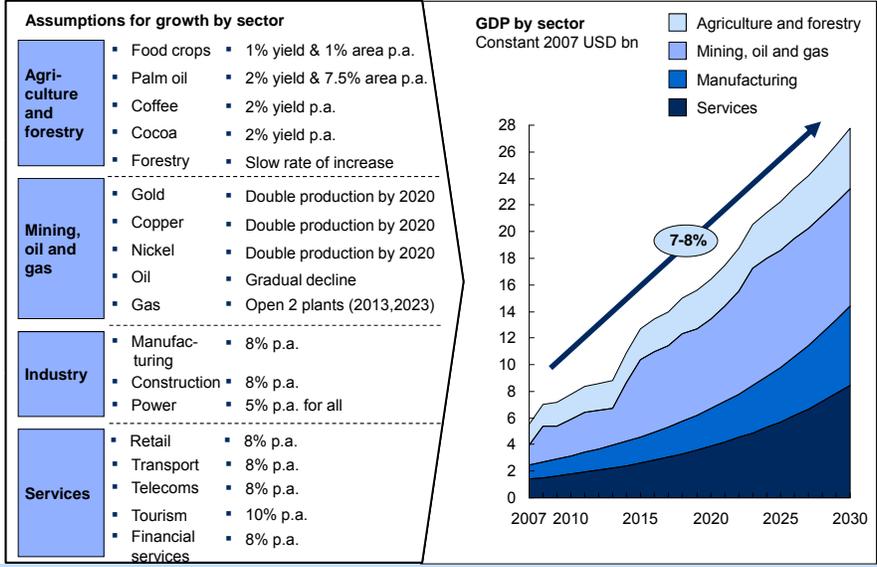
| 3

Papua New Guinea's Vision 2050 emphasises wealth creation, human development and climate and environmental sustainability

"We will be a
smart, wise, fair and happy society
in 2050" (top 50 in UN Human Development Index)

- Strategic planning, integration and control
- Institutional development and service delivery
- Human and social capital development
- Wealth creation
- Security and international relations
- Climate and environmental sustainability
- Churches and development

Critical enablers: 1 Effective leadership and good governance;
2 Healthy, educated and skilled citizens; 3 Enabling legislation and policies;
4 Enabling basic infrastructure; 5 Financial capacity; 6 Effective service delivery;
7 Enabling citizen values and participation; 8 Performance and accountability

| 4

To achieve this Vision, the economy will have to grow by 7-8% per year to achieve a GDP per capita of USD 3,000 by 2030

Real GDP per capita
USD, constant 2007

GPD growth required
CAGR

Business as Usual –
high growth
(Vision 2050) — **7-8%**

Business as Usual –
historic growth — **3-4%**

Historic growth scenario
assumes GDP grows at
similar rate to 2002-07, with
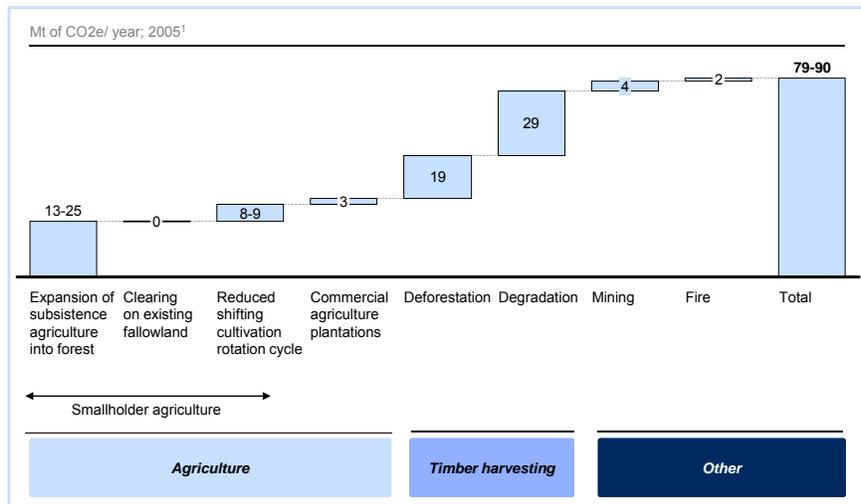constant resource prices

2005   10   15   20   25   2030

| 5

The Vision could be achieved by a 'Business as Usual' high growth path, relying heavily on agriculture, mining, oil, gas and services

Assumptions for growth by sector

Agri-culture and forestry		
	Food crops	1% yield & 1% area p.a.
	Palm oil	2% yield & 7.5% area p.a.
	Coffee	2% yield p.a.
	Cocoa	2% yield p.a.
	Forestry	Slow rate of increase

Mining, oil and gas		
	Gold	Double production by 2020
	Copper	Double production by 2020
	Nickel	Double production by 2020
	Oil	Gradual decline
	Gas	Open 2 plants (2013,2023)

Industry		
	Manufac-turing	8% p.a.
	Construction	8% p.a.
	Power	5% p.a. for all

Services		
	Retail	8% p.a.
	Transport	8% p.a.
	Telecoms	8% p.a.
	Tourism	10% p.a.
	Financial services	8% p.a.

GDP by sector
Constant 2007 USD bn

- Agriculture and forestry
- Mining, oil and gas
- Manufacturing
- Services

7-8%

| 6

Total emissions resulting from land use, land-use change and forestry were approximately 79-90Mt CO_2e in 2005

Mt of CO2e/ year; 2005[1]

Expansion of subsistence agriculture into forest	Clearing on existing fallowland	Reduced shifting cultivation rotation cycle	Commercial agriculture plantations	Deforestation	Degradation	Mining	Fire	Total
13-25	0	8-9	3	19	29	4	2	79-90

Smallholder agriculture
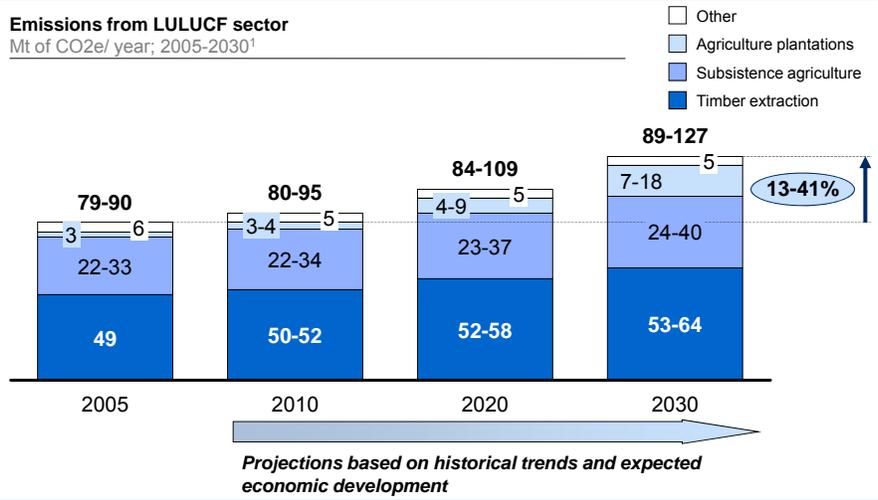
Agriculture | *Timber harvesting* | *Other*

1 High and low scenarios. Historical emissions calculated bottom-up, based on average existing analysis on historical forest cover change. Timber extraction assumed to result in 15% deforestation and 85% degradation

SOURCE: Hunt, Fox, Shearman, Max Planck Institute

| 77

In a Business as Usual scenario, these emissions are expected to increase by between 13 and 41% by 2030

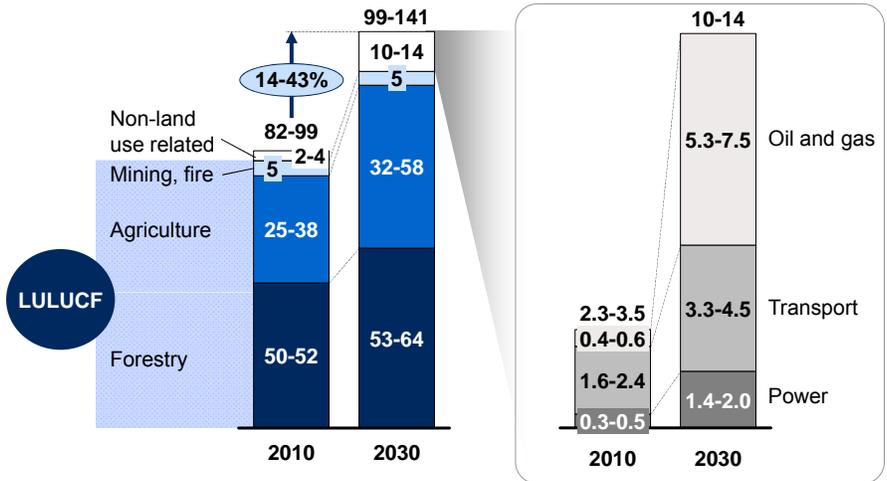**Emissions from LULUCF sector**
Mt of CO_2e/ year; 2005-2030[1]

Legend:
- ☐ Other
- Agriculture plantations
- Subsistence agriculture
- Timber extraction

2005: 79-90
- 3
- 6
- 22-33
- 49

2010: 80-95
- 3-4
- 5
- 22-34
- 50-52

2020: 84-109
- 4-9
- 5
- 23-37
- 52-58

2030: 89-127
- 5
- 7-18
- 24-40
- 53-64

13-41%

Projections based on historical trends and expected economic development

1 2005 emissions computed based on average of MPI-Shearman (adjusted) forest change model, which includes deforestation from Ok Tedi tailings spill incidence in "Other". Emissions from 2010 onwards based on extrapolated historical trend (subsistence agriculture), modified historical trend (fire), and economic development aspirations (timber extraction, agriculture plantations), while other continues to take additional effect for Ok Tedi mine into account.

SOURCE: Shearman (2008), MPI-BGC (2007), Team analysis

| 8

LULUCF emission will still be the main contributor despite a 3-4 fold increase of emissions from power, transport and oil and gas

BAU GHG emissions by sector
Mt of CO_2e/year

99-141

2010: 82-99
- Non-land use related: 5
- Mining, fire: 2-4
- Agriculture: 25-38
- Forestry: 50-52

14-43%

2030:
- 10-14
- 5
- 32-58
- 53-64

LULUCF

Detail (Non-land use related):

2010: 2.3-3.5
- Oil and gas: 0.4-0.6
- Transport: 1.6-2.4
- Power: 0.3-0.5

2030: 10-14
- Oil and gas: 5.3-7.5
- Transport: 3.3-4.5
- Power: 1.4-2.0

SOURCE: McKinsey analysis based on multiple sources

| 9

Historically, deforestation and forest degradation in PNG has mainly been caused by smallholder agriculture and forestry

Driver of deforestation	Proportion	Description
Smallholder agriculture	20-30	• Increasing population leads to expansion of cropping area into forest (and shortening of rotation cycle)
Commercial agriculture	10-15	• Clearing of forest for establishment of commercial plantations (predominantly oil palm), mainly on fertile lowland forests
Timber harvesting	50-65	• Logging results in significant deforestation and degradation, mainly in lowlands/islands and middle altitudes • Current logging practices are unsustainable
Mining, infrastructure	5-10	• Historically largely from mining, less from infrastructure • Comprises direct and indirect deforestation (e.g. forest dieback due to Ok Tedi spill)
Fire	2-3	• Caused by humans (hunting, spreading from subsistence burning) and lightning, mainly in upper montane forests • Forest degradation makes fires more likely

| 10

Contents
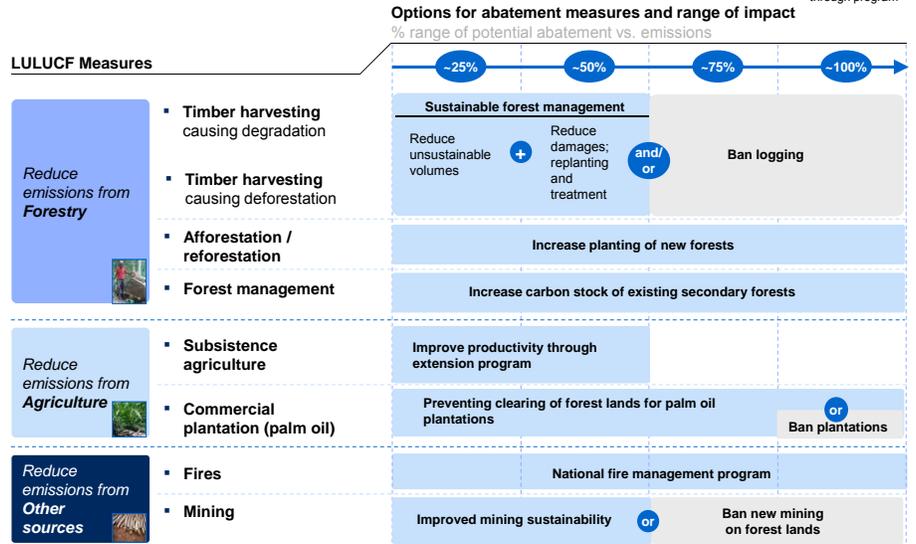
1 Business as usual

2 **REDD+ initiatives**

3 Next steps

| 11

The abatement in the land use, land-use change and forestry sector will primarily come from forestry and agriculture measures

Stop current activity
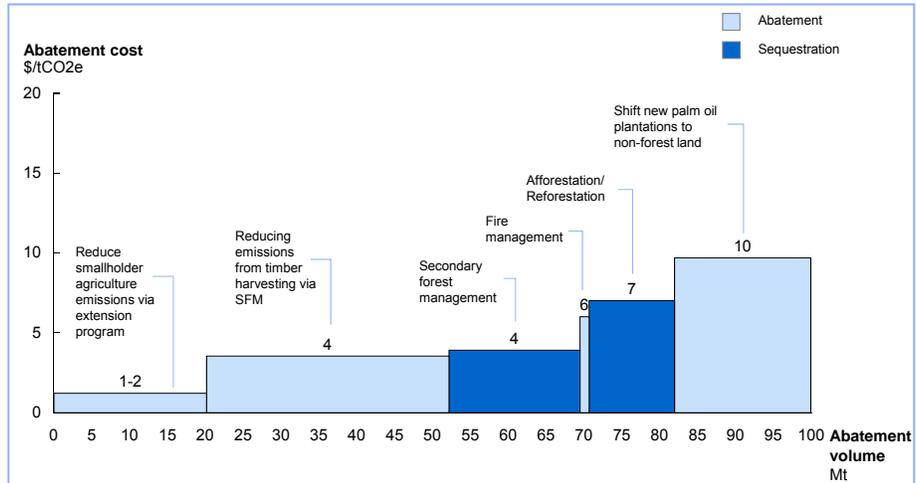Reduce emissions through program

Options for abatement measures and range of impact
% range of potential abatement vs. emissions

LULUCF Measures

~25% ~50% ~75% ~100%

Reduce emissions from Forestry

- **Timber harvesting** causing degradation
- **Timber harvesting** causing deforestation

Sustainable forest management

Reduce unsustainable volumes + Reduce damages; replanting and treatment and/ or Ban logging

- **Afforestation / reforestation**

Increase planting of new forests

- **Forest management**

Increase carbon stock of existing secondary forests

Reduce emissions from Agriculture

- **Subsistence agriculture**

Improve productivity through extension program

- **Commercial plantation (palm oil)**

Preventing clearing of forest lands for palm oil plantations or Ban plantations

Reduce emissions from Other sources

- **Fires**

National fire management program

- **Mining**

Improved mining sustainability or Ban new mining on forest lands

SOURCE: Team analysis

| 12

Analysis suggests up to 100 Mt of abatement potential in 2030 from programmes tackling emissions from forestry and agriculture

PRELIMINARY

2030 high GHG emissions scenario

Abatement
Sequestration

Abatement cost
$/tCO2e

Reduce smallholder agriculture emissions via extension program — 1-2

Reducing emissions from timber harvesting via SFM — 4

Secondary forest management — 4

Fire management — 6

Afforestation/ Reforestation — 7

Shift new palm oil plantations to non-forest land — 10

Abatement volume
Mt

Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below USD 90 per tCO$_2$e if each lever was pursued aggressively, starting with the most affordable levers. It is not a forecast of what role different abatement measures and technologies will play. Assumes a 4% societal discount rate
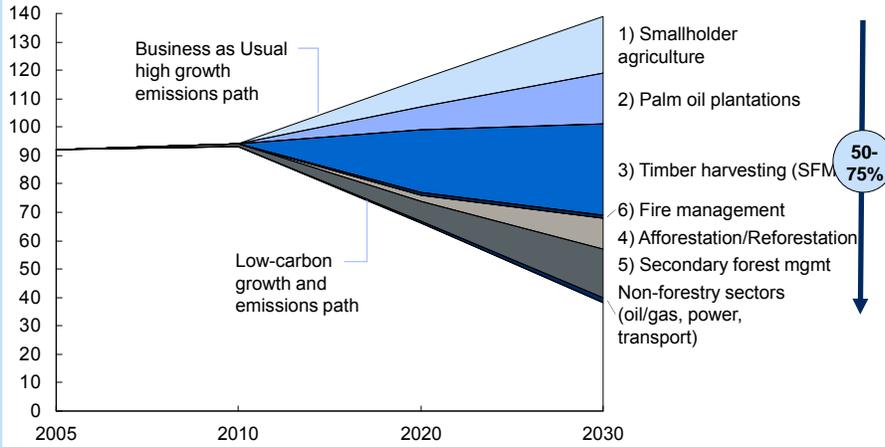
SOURCE: McKinsey analysis based on multiple sources

| 13

This will allow emissions to be reduced by 50-75% by 2030 under a best case scenario

Emissions from all sectors under maximum abatement scenario
Mt of CO2e/ year; 2005-2030

Business as Usual high growth emissions path

Low-carbon growth and emissions path

1) Smallholder agriculture

2) Palm oil plantations

3) Timber harvesting (SFM

6) Fire management
4) Afforestation/Reforestation
5) Secondary forest mgmt
Non-forestry sectors (oil/gas, power, transport)

50-75%

140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

2005   2010   2020   2030

| 14

Contents

1 Business as usual

2 REDD+ initiatives

3 Next steps

| 15

The technical working groups are now helping take this strategy and roadmap forward towards implementation

Initial strategy work identified focus areas for climate-compatible development

- **Mitigation**: developed emissions forecasts and opportunities for abatement, using a cost curve approach

- **Adaptation**: identified climate change related hazards identified, quantified impact, assessed costs and benefits of counter-measures

- **Low-carbon growth**: developed scenarios for growth of all economic sectors and opportunities to decarbonise them
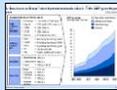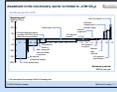
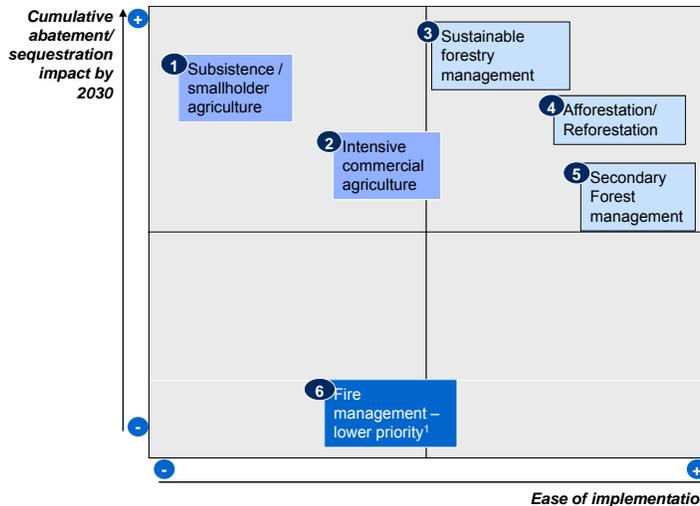**Now we are working to complete the strategy/roadmap and begin implementation**

A Climate-Compatible Development
- Refining analysis with technical working groups
- Integrating with Vision 2050, LTDS, MTDP

B Program design
- Working groups identify pilot & programs to test / scale up approaches
- Preparing donor requests

C Institution and capabi-lity building
- Strengthening and recreating climate change institutions

D Stakeholder engagement
- Communication with government and select stakeholders in Pt Moresby
- Broader national outreach planned

The REDD+ working group is pursuing five programmes as a matter of high priority

PRELIMINARY

Cumulative abatement/ sequestration impact by 2030

1 Subsistence / smallholder agriculture
2 Intensive commercial agriculture
3 Sustainable forestry management
4 Afforestation/ Reforestation
5 Secondary Forest management
6 Fire management – lower priority[1]

Ease of implementation
- Number of ministries involved
- Number of stakeholders involved (civil society, private sector)
- Geographical dispersion

Five major programmes should be prioritized to achieve the maximum benefit, based on impact and ease of implementation

1 Subsistence/ smallholder agriculture
2) Intensive commercial agriculture (e.g. palm oil)
3) Sustainable forestry management (SFM)
4) Afforestation / Reforestation
5) Secondary forest management

1 Fire management was considered a lower priority, given its low level of abatement relative to the effort involved

Barriers for successful scale-up determine the approach to be taken

Barriers

Do we know the solution?   Do we have stakeholder buy in?   Do we have enough capacity?

Approach & rationale

Approach	Purpose	Example
Explorative pilot	Understand how to solve the problem	Rural electrification operating model
Demonstration project	Ensure stakeholder buy-in	Coastal defenses – build seawall in Wewak
Scale-up initiative	Build capacity	Medium-sized hydro-power for Lae & NCD
Program	Get maximum impact	Roll back Malaria with GF support