Assessment of business models for low-emission land-use management in Asia

USAID/RDMA Regional Environmental Office

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Assessment of business models for sustainable landscapes in Asia: Table of contents

RATIONALE

The agriculture, forestry, and other land use (AFOLU) sector accounts for nearly one-quarter (20-24%) of total global greenhouse gas (GHG) emissions. Shifting the AFOLU sector toward low-emission pathways (i.e. "sustainable landscapes"), especially in Asia where this proportion is much higher, is necessary to avert the worst impacts of climate change. Emissions reductions in the AFOLU sector must be achieved while producing more food, fiber, and wood products. Thus, collaboration with private sector producers of these commodities is critical. And capital for investment is critical: an estimated $160 billion per year in private sector financing and investment is needed to realize low-emission AFOLU supply chains. It is essential to overcome the key barriers impeding private sector investments in sustainable landscapes. One barrier is the apparent lack of "investible" AFOLU sector businesses, and this study focuses on this barrier.

OBJECTIVE

USAID RDMA commissioned this study to identify low-emission land management investment strategies that are profitable and investible. Specifically, the study aims to identify high-value business models and case studies that support sustainable landscapes, are profitable, and have potential to catalyze private sector investments in Cambodia, Indonesia, the Philippines and Vietnam, with broader scalability across the region. The study considers sustainable landscape business models related to implementing best practices in commercial agriculture and forestry, which reduce greenhouse gases emissions, enhance carbon storage, and provide other benefits for human well being.

METHODOLOGY

After carrying out desk research, stakeholder interviews, and field visits during August 2016 in Cambodia, Indonesia, Philippines and Vietnam, the team used a two-phase process to explore a wide range of opportunities in the AFOLU sector for environmental impact, profitability, and scalability. First, the team assessed 80 business cases across various geographies, sectors, commodities, GHG emission reduction practices, and value chain stakeholders using 4 principal criteria: (i) impact potential, (ii) economic effectiveness, (iii) innovation and scalability, and (iv) other factors. Based upon its review of the business cases, the team elaborated 12 knowledge briefs that identify opportunities for scaling up and catalyzing private sector investment toward sustainable, low emission enterprises and practices. This eventually led to the development of **8 prototype business model frameworks** covering the range of market and landscape opportunities identified in the review. The analysis of the business models considered: (i) potential financial returns from a particular sustainable landscape activity, (ii) the business rationales for risk bearers and other key stakeholders, and (iii) the extent to which private sector investments were driving a particular activity.

Prototype Business Model Frameworks

1. Sustainable agricultural production and forestry commodity production that helps reduce reputational risks and/or improve access to export markets
2. Sustainable agricultural production that helps increase smallholder market size and improve smallholders' credit worthiness and/or margins
3. Sustainable agricultural production approaches and practices that help meet internal sustainability targets and/or secure supply chains
4. Forest conservation achieved as a condition and co-benefit of sustainable agricultural production for niche domestic market and/or export market
5. Watershed management to secure water resources via payment for forest ecosystem services

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(METHODOLOGY Continued)

6. Forest conservation and restoration for offsets trading
7. Forest conservation via eco-tourism
8. Technology, applications and systems to support GHG emissions reductions

The draft findings were validated and refined based on input from 80 landscape experts from 16 countries at a regional workshop in Bangkok on September 26th, 2016. The team incorporated recommendations from workshop participants to make the results as useful as possible for developing public and private partnerships and market-based approaches for private sector investments especially in agriculture, which is still driving forest lost and degradation in Southeast Asia.

ASSESSMENT RESULTS

The business models focusing on generating returns from agriculture and forestry commodity production (1-4) demonstrated the greatest promise for mainstream private sector engagement. Business models emphasizing securing sustainable supply chains and accessing export markets (1 and 3) demonstrated the best combination of impact potential, economic effectiveness, and model maturity. Model 2, focused on improving smallholder margins was considered profitable and mature, but had only moderate impact potential. In contrast, model 4, which focused on achieving forest conservation as a condition and co-benefit of commodity production, had high impact potential, but was considered as less profitable and less mature as an investment strategy. Although the business models focusing on non-production returns (models 5-8) generally have potential to deliver positive impacts, the assessment found that they mostly represent still nascent or niche opportunities.

ASSESSMENT USE

It is hoped that the suite of business models and supporting case studies presented in this report provides useful information for donors, practitioners, bankers and investors/ fund managers, agro-forestry firms, land use experts, and NGOs working to implement and upscale sustainable landscapes investments. The success of these business models – and donor efforts to catalyze and facilitate a shift toward low emission land use, sustainable supply chains, and responsible investment and trade – depends on the potential to build on existing low emission land management efforts, aggregation of investment pipelines and environmental impacts across landscapes, and the active participation from the financial sector.

Assessment of business models for sustainable landscapes in Asia: Acknowledgements

The assessment of business models for low-emission land-use management in Asia was carried out by Dalberg Global Development Advisors under USAID's Investment Support Program, in collaboration with the U.S. Forest Service, and with funding from the USAID Regional Development Mission for Asia (RDMA). The authors of this report are grateful for the efforts of the many who have been involved in methodology design, data collection and analysis.

We would like to express special thanks to USAID RDMA, USAID DC, and bilateral USAID missions in Cambodia, Philippines, Indonesia and Vietnam, as well as their implementing partners, for providing helpful guidance on the methodology. Additionally, this comprehensive work would have been impossible y without the case studies, sharing of insights, and intensive coordination efforts made by companies and organizations in their respective countries, : Uniliver (Vietnam), Kfw (Vietnam), Minh Phu (Vietnam), the Borneo Initiative (Indonesia), Bank Andara and Mercy Corp (Indonesia), PT RMU (Indonesia), WWF (Indonesia), Manila Water (Philippines), Rocky Mountain (Philippines), Philippines Biochar Association, Wildlife Alliance (Cambodia), WCS (Cambodia). We would also like to thank all participants in the September 26th workshop for their feedback and recommendations on the findings presented and working group discussions, which added significant value and helped us finalize the assessment. Finally, we are grateful to a number of peer reviewers, especially Pablo Pacheco and Philippe Guizol from CIFOR, Rachel Zedeck from Control Union, and Alison Eskesen from Grow Asia, whose contributions and critical comments were invaluable for completing this report.

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- Shifting the agriculture, forestry, and other land use (AFOLU) sector toward low emissions pathways is necessary to help avert the worst impacts of climate change because the AFOLU sector contributes 20-24% of total global greenhouse gas (GHG) emissions. This proportion is much higher in Southeast Asia (e.g., 39% in Malaysia, 71% in Indonesia, and 97% in Laos).
- Achieving this shift is a key aim of USAID's *Sustainable Landscapes*[1] (SL) activities.
- AFOLU is the only sector in which GHG emissions can be reduced and carbon can be sequestered[2] through a combination of sound land allocation and good land management practices.
- While AFOLU GHG emissions and removals are a critical piece of the total carbon (and other GHG) abatement puzzle, realizing them is also complex.
- AFOLU emission reductions and removals must be achieved while producing 50% more food, as well as more fiber and wood products, to meet growing demands and needs.
- ***Collaboration with the private sector, which drives production of these commodities, is critical.***

The AFOLU sector accounts for 20-24% of global greenhouse gas (GHG) emissions in 2010 and Asia contributed the largest proportion of global AFOLU emissions during 1990-2010

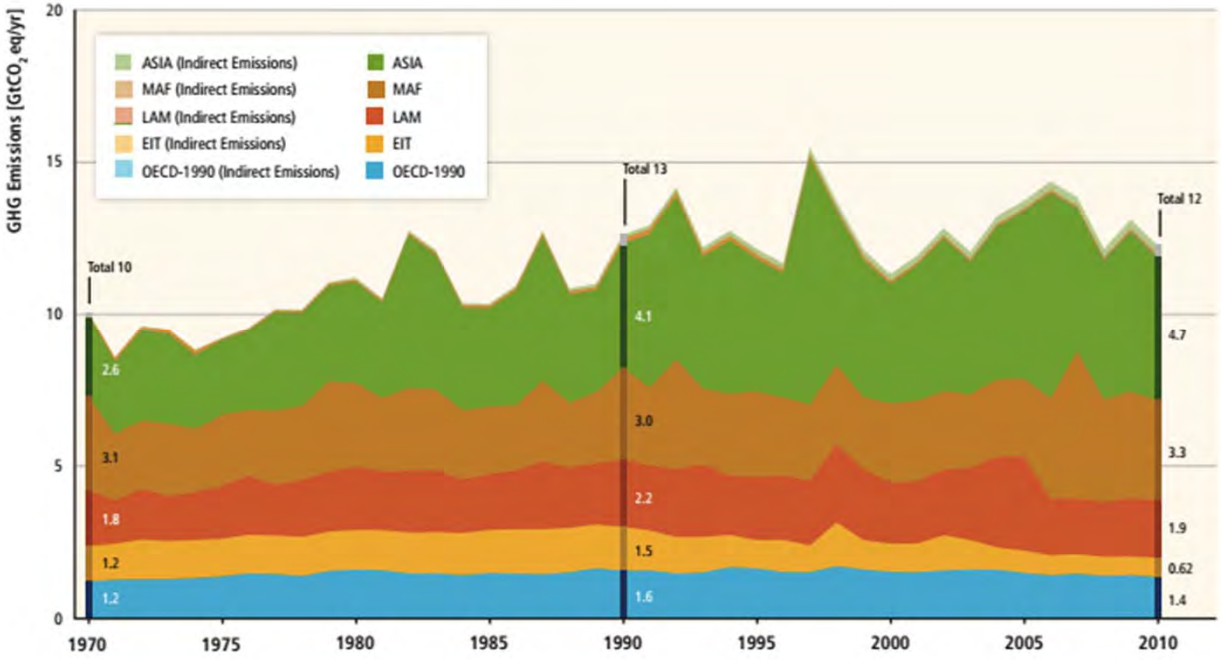


Figure 1: Global GHG emissions from AFOLU by region during 1970-2010

Source: Smith et al. (2014) – IPCC 5th Assessment Report Chapter 11

[1] USAID's *Sustainable Landscapes* program assists countries to slow, halt, and where possible reverse, GHG greenhouse gas emissions from land use, including forests and agricultural ecosystems. Use of the term in this report refers to achievement of this goal.

[2] Carbon is sequestered (i.e., removed from the atmosphere) by plants through photosynthesis. Hereafter, sequestration is referred to as "removals".

- The Paris Agreement, forged at the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015, formally recognized the role of AFOLU in climate change mitigation and adaptation.
- The Paris Agreement also recognized the need for state and non-state actors, especially the private sector, to invest in technologies and practices that reduce emissions and enhance removals.
- Asian governments have signaled their intent to reduce their AFOLU emissions.
- Many private companies are also taking steps to reduce their carbon footprints.
- **Several major companies with AFOLU sector supply chains have voluntarily pledged to reduce their emissions** and to source their supplies without contributing to deforestation. (Logos of just a few of the companies that have made zero deforestation commitments or committed to sustainable palm oil targets are shown below.)

The number of pledges by corporations to reduce deforestation risks in their supply chain of commodities increased rapidly (over 30 times) from 2009 to 2015

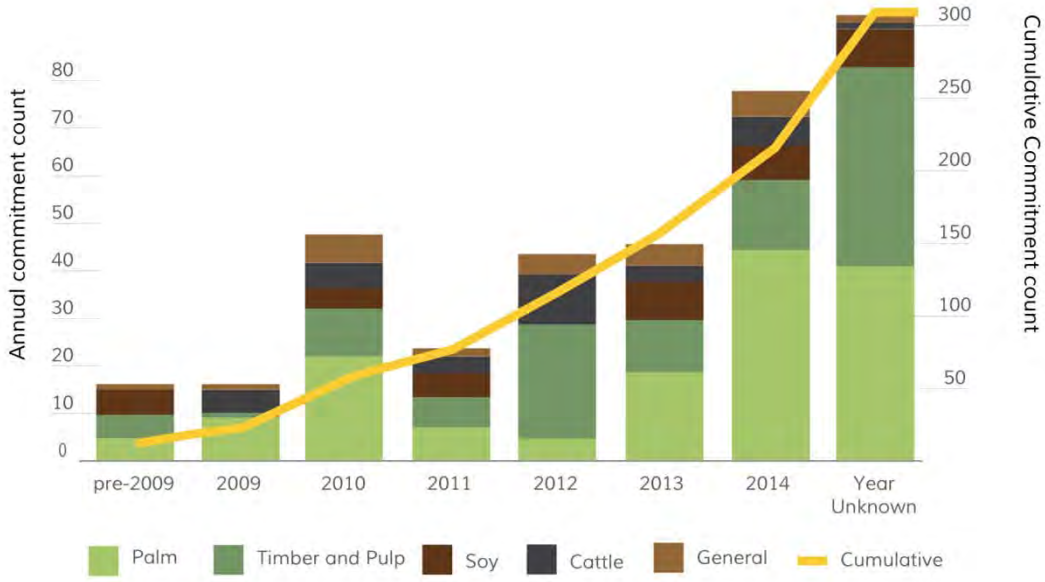


Figure 2: Annual & cumulative corporate pledges in the AFOLU sector

Source: Forest Declaration (2016)

Assessment of business models for sustainable landscapes in Asia: Background and Introduction

- The rapid rise in voluntary corporate pledges (noted in slide 7) hints at the scale of the problem: much more investment is needed to shift the AFOLU sector toward low-emission pathways.
- According to research by the Tropical Forest Alliance 2020, approximately $160 billion per year in private sector financing and investment is needed to realize sustainable, low emission supply chains for the AFOLU sector
- Given the scale of investment required and the diversity of financial services and products needed, USAID RDMA and other donors have realized that it is crucial to catalyze private sector investments to transform the AFOLU sector in Asia.
- In 2015, USAID RDMA commissioned a study to explore financing mechanisms for private sector investments for sustainable landscapes[1] , and then in early 2016 convened a workshop to validate and refine the recommendations[2].
- Recognizing that one of the key barriers impeding private sector investments in sustainable landscapes is the apparent lack of 'investible' AFOLU sector businesses, ***USAID RDMA commissioned the current study to identify existing or potential low-emission land management investment strategies that are profitable and investible*** (attractive for private sector investment).
- This report presents results of the study and includes inputs obtained from sectoral experts, practitioners, and others during a workshop that USAID RDMA convened in Bangkok in September 2016.

[1]The study is available at http://pdf.usaid.gov/pdf_docs/PA00KTM4.pdf
[2]The workshop report is available at http://pdf.usaid.gov/pdf_docs/PA00M139.pdf

Assessment of business models for sustainable landscapes in Asia: Limitations of this report

Despite its contribution of original insights into AFOLU investment strategies in Cambodia, Indonesia, Philippines and Vietnam, this research has a few limitations primarily arising from the data collection methodology and scope of the study.

1 Methodological limitations

- **Data limitations** – The research relied primarily on key informant interviews because of limited time and resources. The information obtained provided a limited basis for quantifying results. Specifically, it was not feasible to obtain sufficient data to statistically assess the investment strategies' profitability. Data were also not generally available to quantify emission reduction potential. To address these data gaps, we used a combination of self-reported data, default values, and expert judgement, and then checked our assumptions and conclusions with key informants.

- **Potential bias** – Findings could be biased because the initial screening for key informants involved internet searches, which may have inadvertently skewed our focus toward companies whose websites were available in an international language. In addition, the information from these websites, rather than on knowledge of local context, also could have influenced the results. The interviews included primarily multi-national, established domestic players, and international NGOs. We conducted fewer interviews with farmers' associations and government officials. To address this limitation, we asked key experts from USAID missions and development agency partners with in-depth understanding of local context and situation of each country of study to provide inputs to the list of key informants.

- **Commodity production focus** – We focused on production of single commodities because we thought it would represent the majority of investment strategies identified in our literature review, and because we aimed to uncover existing investment strategies and opportunities by private sector individuals. As a result, we did not generally explore multi-commodities management or linkages between commodities production and landscape level processes and context.

2

Geographical and sector coverage limitations

- **This study only included Cambodia, Indonesia, Philippines and Vietnam.** We selected these 4 countries for their differences in level of policies and enabling frameworks, sector awareness of sustainability, stakeholder capacity, and market dynamics. The study offers a rich qualitative understanding of investment strategies in these four countries, but generalization of the findings and transferability of these results to other Asian countries should be made with caution.

- **Oil palm was not included in this study** because the commodity has already received considerable attention from development agencies, practitioners, NGOs and business communities. Therefore it was deemed strategic to utilize the limited resources of this research to highlight other agricultural and forestry commodities, and services that have attracted comparatively limited attention. Nevertheless, potentially valuable insights could also have been generated from the study of oil palm.

- **We generally excluded fisheries management and aquaculture.** We did include shrimp cultivation where it related to, or interacted with, mangrove conservation and management.

*The objective of this study is to **identify high-value business models that support sustainable landscapes** in Cambodia, Indonesia, the Philippines and Vietnam – with broader scalability across the region*

Research objectives

- **Describe 12 existing or potential business models and case studies**: these include implementing best practices in commercial agriculture, changing to lower-emission or higher-carbon-storage crops; deforestation-free and other higher carbon reduction activities, such as conservation, reforestation, restoration, etc.
- **Outputs of the projects** will be used to:
  - (i) serve as an input for an investment/finance in sustainable landscapes workshop
  - (ii) further USAID/RDMA's knowledge and understanding of existing investable business models

In-scope

- Development of a rigorous selection and assessment criteria
- Market scan for businesses, organisations, and programmes in the relevant space
- Database of businesses, organisations, and programmes by sector and commodity
- Review of business models and case studies, as available, to understand conservation potential and commercial viability
- Review financial sustainability of business models if they employ sustainable landscapes practices
- Develop knowledge notes for 12 business models and case studies

Assessment of business models for sustainable landscapes in Asia: Research objectives and study methodology

We performed a micro-analysis in the four countries using a three-part primary and secondary research methodology to validate findings and landscape the market for a pipeline of scalable SL opportunities

Desk research

Leveraged internal resources and external publically-available research reports and resources to develop an understanding of fundamental market dynamics:

Internal sources:

- Past Dalberg project work (USAID Sustainable Landscape Financing, Study on the Applicability of Results-Based Financing Mechanisms for REDD+, Initiative for Smallholder Finance, etc.)

External sources:

- Other organisations/programmes (UN-REDD Programme, IDH Sustainable Trade Initiative, Forests Asia Summit, Global Landscapes Forum, etc.)
- Other external desk research reports (World Bank, IFC, UN, FAO, CIFOR, Credit Suisse, etc.)

Expert interviews

Conducted a series of interviews with USAID RDMA and Dalberg country experts to help understand sustainable landscapes and the local context:

USAID/RDMA content experts:

- Climate change and environment/forestry specialists
- In-country bilateral missions

Dalberg:

- Yana Kakar, Global Head of Agriculture and Food Security practice
- Sonila Cook, Global Head of Energy and Environment practice
- Serena Guarnaschelli, Innovative finance specialist
- Dalberg industry contacts

In-country field visits

Spoke with c.70 key individuals during 14-day in-country visits during August 7-20, 2016, including (i) local entrepreneurs and key industry players, (ii) NGOs and implementation partners, (iii) financial intermediaries and investors, (iv) government stakeholders and (v) other experts to validate findings and identify potentially scalable business models in:

- Cambodia
- Indonesia
- Philippines
- Vietnam

We approached this market landscaping exercise with a portfolio diversification strategy to maximise the breadth of high-value SL opportunities across a cross-section of demand-driven business model characteristics

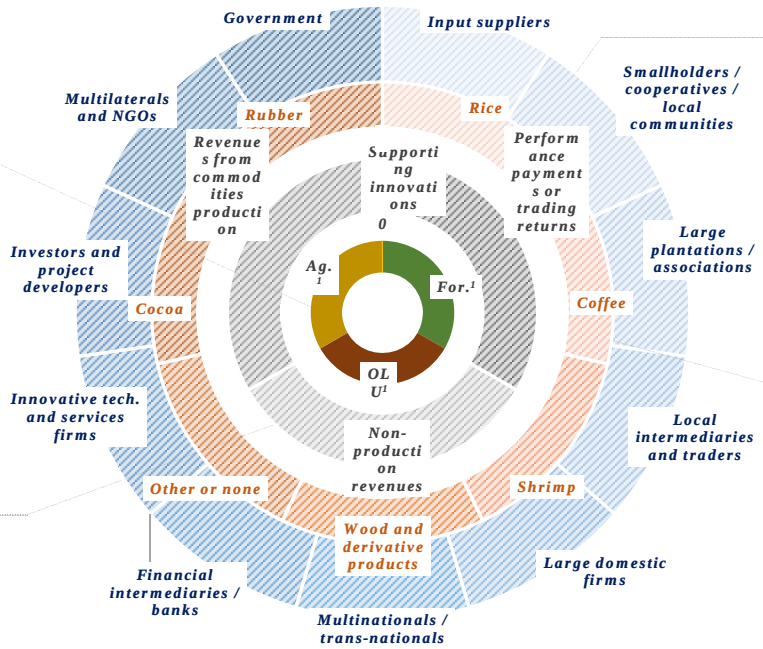
Characteristics of demand-driven business models

Sectors and mitigation activities

USAID/RDMA has prioritized the sustainable reduction of greenhouse gas (GHG) emissions through commercially-viable private sector interventions in the **Agriculture, Forestry and Other Land Uses (AFOLU) sectors** in Southeast Asia, including Cambodia, Indonesia, the Philippines and Vietnam

Types of returns for sustainable landscape activities[2]

Three categories of SL returns can incentivise private-sector engagement in SL mitigation activities: revenues from sustainable goods production, returns on ecosystem services and carbon offsets or trading, and other non-production product and service revenues



Stakeholders and incentives

This portfolio strategy aims to engage a **diversity of value chain and supporting actors across the entire AFOLU ecosystem**. High-value opportunities require creating incentives across multiple actors to ensure broad stakeholder buy-in and long-term sustainability

Commodities[2]

Seven commodity groups were prioritised based on input from regional and local RDMA missions, expert and stakeholder interviews, and desk research of high-value targets for GHG emissions reductions and land-use management

[1] Agriculture, Forestry and Other Land Uses (AFOLU)
[2] USAID/RDMA has excluded oil palm as outside the scope of this study

Specifically, we looked to align investment risk bearers and key stakeholders, potential returns for implementing SL activities with different levels of private sector investment to identify 8 business models

A		B		C		D
WHY **Potential returns from SL activity, or business rationale for stakeholders to bear risks**	+	**WHO** **Investment risk bearer(s) and key stakeholders**	+	**HOW** **Extent of private sector investment[1]**	=	**8 business models[2]**

[1]The extent of private sector investment refers to level of monetary investment that private sector and/or donor/NGO provided . Generally this varies from pure private sector investment, mix of private sector and donor/NGO investment, and pure donor/NGO funding. This criterion to a certain extent helps determine the key actor(s) driving the business.
[2] This term refers to business investment strategy

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Given RDMA priorities of reducing emissions in Agriculture, Forestry and Other Land Uses (AFOLU)[1], we focused on five types of returns to incentivise mitigation activities in four target sectors…

Sector	Potential returns for sustainable landscapes activity[2]	Mitigation activity
	Potential returns from commodity production	
Forestry	**Revenues from sustainable commodity supply chain** – examples of business rationales include improved margins, secure procurement, and access to key export markets	- *Lowering GHG in agricultural production* - *Reforestation* - *Sustainable forest management/avoid deforestation*
	Non-production performance-based and trading returns	
Agriculture	**Performance-based payment for ecosystem services (PFES)**	- *Reforestation* - *Sustainable forest management/avoid deforestation*
Tourism	**Return on carbon credits and offsets trading**	- *Reforestation* - *Sustainable forest management/avoid deforestation*
	Non-production products and services revenues	
	Site access and related revenues from eco-tourism	- *Reforestation* - *Sustainable forest management/avoid deforestation*
Aquaculture[3]	**Revenues on supporting technologies, applications and services**	- *Technology and services supporting lowering GHG emissions*

[1] We exclude certain activities as outside the scope of low-emission land use in AFOLU sectors, including renewable energy generation, green cities and real estate rehabilitation/development. Additionally, we primarily considered projects with mitigation rather than adaptation impacts, although some may be cross-cutting
[2] Categorisation was developed based on desk research, expert/stakeholder interviews and input from bilateral USAID missions
[3] We include aquaculture to the extent that sustainable practices relate to reforestation/conservation of degraded forest lands (e.g., shrimp fisheries in mangrove forests)

*...and explored the underlying business rationale that can incentivise **private-sector stakeholders** to bear the risk to implement mitigation activities*

Performance-based compensation or return on project/trading

Monetisation of products and services

Increased loan portfolio and credit quality

Sustainable high-quality supply for global markets and improved brand reputation

Increased smallholder market size

Improved margins and diversified profits

Access to key export markets and improved brand reputation

Sustainable high-quality supply for domestic and/or export-oriented off-takers

Sustainable high-quality supply for domestic and/or access to key export markets; improved brand reputation

Returns from agricultural and forestry commodity production | **Non-production revenues** | **Non-production performance-based and trading returns**

Notes:
[1] Based on desk research and expert/local stakeholder interviews
[2] Includes eco-tourism project developers that are otherwise categorised under the 'Non-production products and services'

Assessment of business models for sustainable landscapes in Asia: Key findings on business models

D

By linking returns for mitigation activities to stakeholder incentives and gauging the extent of private sector investment, ***we were able to identify 8 prototype business model frameworks*** *that are robust across geographies and commodities*[1]

Stakeholders and investment risk bearer[2]	Business rationale[3]	Extent of private sector investment	Mitigation activity[4]	Business model / investment strategy	Case study/knowledge brief
Domestic firm	Improve productivity, reduce costs, and access export markets	100% private sector	- Agricultural mitigation practices - Afforestation / reforestation (A/R)	**1. Sustainable agricultural and forestry commodity production that helps reduce reputational risks and/or improve access to export markets**	**Rocky Mountain** in **Philippines** adopts environmental-friendly practices in their coffee plantation for increased productivity, reduced costs, and access export markets **The Borneo Initiative** in **Indonesia** (and other partners) provides grant and training to timber concessions to apply for FSC certification to access export markets and to reduce impact from logging **Kfw** in **Vietnam** provides grant to the government to reforest plantation, and **WWF** provides grant and training for FSC certification to increase forest cover
	Generate certified forestry commodity for export market and for lowering reputational risk	100% private sector	- A/R, SFM		
Donor/NGO, Domestic firm	Generate certified forestry commodity for export market	100% donor / NGO	- A/R, SFM (reduced logging impact and increased forest cover)		
Input supplier (IS), Financial institution (FI)	IS: Increase smallholder market size by improving smallholders' margins FI: Increase number of borrowers and improve their credit worthiness	100% private sector	- Agricultural mitigation practices	**2. Sustainable agricultural production that helps increase smallholder market size (# of clients/borrowers) and improve smallholders' credit worthiness and/or margins**	**Bank Andara** in **Indonesia**, in partnership with Syngenta and Mercy Corps, is investing to improve SMF margins by helping them adopt 'good agriculture practice' & facilitating access to finance through branchless banking to make them more attractive customers
MNC, Donor/ NGO[5], SHF	Secure agricultural supply chains to meet internal sustainability targets	Mix of private sector and donor/ NGO	- Agricultural mitigation practices - Avoided deforestation	**3. Sustainable agricultural production approaches and practices that help meet internal sustainability targets and/or secure supply chains**	**Unilever** , in partnership with the Sustainable Trade Initiative (IDH) and Rainforest Alliance, co-invests in training SHFs on Rainforest Alliance standards, and Unilever procures sustainably grown certified tea in order to secure supply of sustainable tea and meet internal sustainability commitment

[1] Sustainable landscapes categorisation and mitigation activities are based on input from the U.S. Forestry Service and stakeholder consultations
[2] Several stakeholders beyond private sector actors, including donors, NGOs and others were outlined in Slide 7. Most business models involved several stakeholders. Here we list major stakeholders, and highlight the key risk bearers in bold.
[3] Here we refer to both the principal motivations underlying the investment strategy and the "potential returns for SL activities" as listed in the previous slide.
[4] Please see Annex 4 for a detailed list of relevant mitigation activities and associated mitigation potential.
[5] Donors/NGOs involved in various business models are generally driven by conservation and development goals (forest and wildlife protection, local livelihoods improvement etc.).

Assessment of business models for sustainable landscapes in Asia: Key findings on business models

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By linking returns for mitigation activities to stakeholder incentives and gauging the extent of private sector investment, ***we were able to identify 8 key business model frameworks*** *that are robust across geographies and commodities*[1]

Stakeholders and investment risk bearer[2]	Business rationale[3]	Extent of private sector investment	Mitigation activity[4]	Business model / investment strategy	Case study/knowledge brief
Domestic firm, Donor/NGO	Procure certified aquaculture supply for export market	Mix of private sector and donor/ NGO	- Avoided deforestation, A/R, SFM	**4. Forest conservation achieved as a condition and co-benefit of sustainable agricultural production for niche domestic market and/or export market**	SNV and IUCN provides grant and training for Naturland shrimp certification, and **Minh Phu** in **Vietnam** pays mangrove restoration PES fee procures Naturland certified shrimp to access export markets **Sansom Mlup Prey (NGO operating IBIS rice) and WCS** provide grant for working capital for farmers cooperatives and USDA organic, wildlife-friendly rice certification, in collaboration with WCS for capturing niche domestic demand and for reducing pressure on forest and wildlife in protected area **WWF** in **Indonesia**, in partnership with private sector stakeholders and donors, is helping farmers produce sustainable coffee and increase incomes to prevent them from encroaching into the nearby Park Areas
Donor/NGO, SHFs	Provide alternative livelihood to reduce pressure from forest and wildlife	100% donor/NGO	- Agricultural mitigation practices - Avoided deforestation		
Ecosystem restoration investors and project developers	Performance-based payment for ecosystem services (PFES)	Forestry	- Reforestation - Sustainable forest management/avoid deforestation	**5. Watershed management to secure water resources via PFES**	**Manila Water and Maynilad**, pay BK Foundation (local NGO) to transfer PES payment and capacity building needed to local communities and to manage Le Mesa Ecopark (eco-tourism) for maintaining and protecting Le Mesa watershed
	Return on carbon credits and offsets trading			**6. Forest conservation and restoration for offsets trading**	**PT RMU**, an **Indonesian,** additional to grants received from Terra Global Capital and Permian Global, invests in forest restoration via ecosystem restoration concession and sells their emission reduction credits to Forest Carbon, a carbon credit trader
	Site access and related revenues from eco-tourism			**7. Forest conservation via eco-tourism**	**Wildlife Alliance** in **Cambodia** provides a long-term philanthropic fund to build infrastructure, and provide training for community based enterprise to run ecotourism business in order to reduce pressure on wildlife and forests
Innovative technology and service firms	Revenues on supporting technologies, applications and services	Other	- Technology supporting lowering GHG emissions	**8. Technology, applications and systems to support GHG emissions reduction**	**Philippines Biochar Association** provides training and aggregates biochar producers with investment received from buyers (a mining company)

[1] Sustainable landscapes categorisation and mitigation activities are based on input from the U.S. Forestry Service and stakeholder consultations
[2] Several stakeholders beyond private sector actors, including donors, NGOs and others were outlined in Slide 12. Most business models involved several stakeholders. Here we list major stakeholders, and highlight the key risk bearers in bold.
[3] Here we refer to both the principal motivations underlying the investment strategy and the 'potential returns for SL activities' as listed in the previous slide.
[4] Please see Annex 4 for a detailed list of relevant mitigation activities and associated mitigation potential.

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Assessment of business models for sustainable landscapes in Asia: Key findings on business models

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Business models with 100% private sector investment

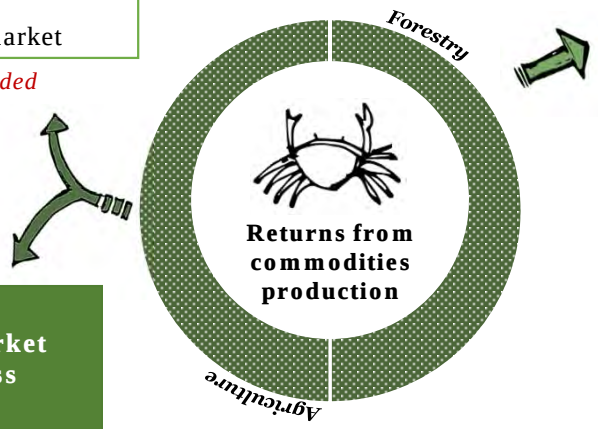
Business model 1: Sustainable agricultural and forestry commodity production that helps reduce reputational risks and/or improve access to export markets

Domestic company (producer, processor, and/or exporter) invests in adoption of sustainable agricultural practices to improve productivity, reduce costs and increase access to export market

Mitigation activity: *Agriculture mitigation practices, avoided deforestation*

Domestic timber company invests in reforestation, sustainable logging and/or plantation management following a certification scheme to access export markets and to lower reputational risk[2]

Mitigation activity: *A/R, SFM*



Business model 2: Sustainable agricultural production that helps increase smallholder market size and improve smallholders' creditworthiness and/or margins

Input supplier and/or financial institute invests in improving productivity, and adoption of sustainable agricultural practices following certification scheme by smallholder farmers for access to new customers

Mitigation activity: *Agriculture mitigation practices*

[1] Although these business models may be broadly cross-cutting across geographies and commodities, local market dynamics and socio-politico-economic factors may make certain models more (or less) relevant than others in a specific local context

[2] Compliance with certification requirements may lead to a price premium as an additional incentive in the short-term; however, this pricing effect is not universal across sectors and commodities and will become less important as sustainable agricultural and forestry management practices become more mainstream

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Assessment of business models for sustainable landscapes in Asia: Key findings on business models

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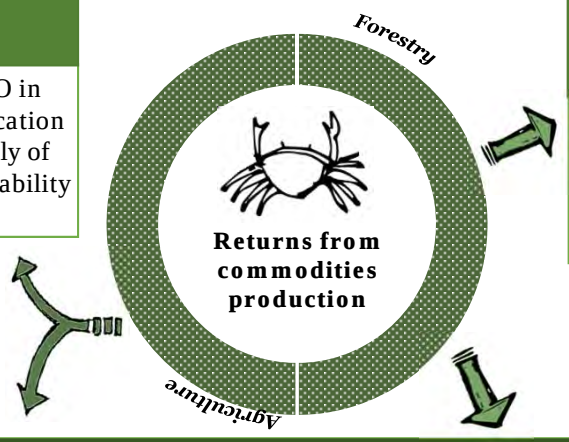
Business models with mixed investment from private sector and donor/NGO, and with only donor/NGO grants

Business model 3: Sustainable agricultural production approaches and practices that help meet internal sustainability targets and/or secure supply chains

MNC (processor and/or exporter) co-invests with donor/NGO in sustainable agricultural practices adoption following a certification scheme by SHFs and procures the products for securing supply of sustainably produced commodities and meet internal sustainability target

Mitigation activity: *Agriculture mitigation practices, A/R*



Business model 1: Sustainable agricultural and forestry commodity production that helps reduce reputational risks and/or improve access to export markets

Donor and/or NGO provides grant and training to timber concessions and/or government for reforestation, sustainable logging and/or plantation management following a certification scheme to access export markets and to reduce impact from logging and increase forest cover

Mitigation activity: *A/R, SFM*

Business model 4: Forest conservation achieved as a condition and co-benefit of sustainable agricultural production for niche domestic market and/or export market

Domestic aquaculture company (producer, processor, and exporter) co-invests with conservation donor/NGO in sustainable production of aquaculture commodities following a certification scheme and procures the commodities for export market

Mitigation activity: *Avoided deforestation, A/R, SFM*

Donor and/or NGO provides grant for working capital and training for farmers' cooperatives on sustainable agricultural practices adoption following a certification scheme for capturing niche domestic demand and for reducing pressure on forest and wildlife in protected area

Mitigation activity: *Agriculture mitigation practices, avoided deforestation*

[1] Although these business models may be broadly cross-cutting across geographies and commodities, local market dynamics and socio-politico-economic factors may make certain models more (or less) relevant than others in a specific local context

[2] Compliance with certification requirements may lead to a price premium as an additional incentive in the short-term; however, this pricing effect is not universal across sectors and commodities and will become less important as sustainable agricultural and forestry management practices become more mainstream

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Assessment of business models for sustainable landscapes in Asia: Key findings on business models

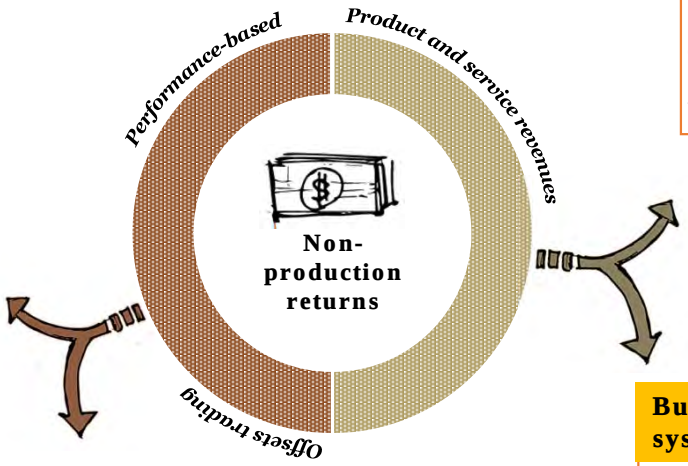
D

By linking returns for mitigation activities to stakeholder incentives and gauging the extent of private sector investment, ***we were able to identify 8 key business model frameworks*** *that are robust across geographies and commodities*

Business model 5: Watershed management to secure water resources via PFES

Ecosystem restoration investors and project developers, local communities or cooperatives finance upstream conservation and reforestation activities to improve ecological services in exchange for performance-based payments by downstream or ecosystem site access users

Mitigation activity: *Reforestation and sustainable forest management/avoid deforestation*
Financial driver: donor driven



Business model 7: Forest conservation via eco-tourism

Project developers and local communities or smallholder cooperatives invest in natural resource conservation to develop eco-tourism/hospitality market for local biodiversity and cultural heritage products and services

Mitigation activity: *Reforestation and sustainable forest management/avoid deforestation*

Business model 8: Technology, applications and systems to support GHG emissions reduction

Input suppliers, technology and applications developers, third-party service providers invest in R&D to develop innovative product and service solutions that can facilitate implementation of sustainable practices in agriculture and forestry

Mitigation activity: *Technology and services supporting lowering GHG emissions*

Business model 6: Forest conservation and restoration for offsets trading

Ecosystem restoration investors and project developers finance conservation and reforestation activities in non-plantation forests to securitise carbon and conservation liabilities offsets in compliance with regulatory and/or voluntary markets

Mitigation activity: *Reforestation and sustainable forest management/avoid deforestation*

[1] Although these business models may be broadly cross-cutting across geographies and commodities, local market dynamics and socio-politico-economic factors may make certain models more (or less) relevant than others in a specific local context

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We grouped the ~80 business cases that we reviewed across the 8 business model frameworks

and assessed them along four key dimensions[2] to measure potential for impact, profit and scale

Impact potential

How can this project be impactful in the sustainable landscape space?

- Estimated mitigation impact and emissions reductions (e.g., expected tonnes of carbon dioxide equivalent reduced/avoided)
- Expected positive environmental, social and economic co-benefits (e.g., air quality, soil quality, biodiversity, cultural heritage, health, education, job creation, poverty alleviation, etc.)

Economic effectiveness and efficiency

What are the key drivers that will make this project financially sustainable?

- Project financial viability and expected rate of return
- Cost-effectiveness of mitigation impact
- Implementation of industry best practices
- Financial adequacy and appropriateness of donor intervention
- Potential to catalyse and/or leverage additional private sector investment

Innovation and scalability

How do we scale this project to maximise commercial return and social impact?

- Capacity for innovation
- Potential for expanding scale and impact of the proposed project (scalability)
- Potential for exporting key structural elements of the project elsewhere within same sector, or other sectors, regions, countries (replicability)
- Market development and transformation

Other assessment factors

Can we partner with credible organisations to deliver on objectives?

- Existence of national climate strategy and existing regulatory policies
- Complementarity to existing USAID sustainable landscapes programmes
- Existence of credible partners with experience/track record of delivery and risk management strategy
- Extensive stakeholder consultations and engagement

[1] We conducted field visits in four countries to meet with local stakeholders and develop a pipeline of potential opportunities in August 2016

[2] Complete list of 24 indicators across four key dimensions is provided in Annex 1. Where concrete quantitative data on identified business cases may be unavailable , we have assessed these criteria on a qualitative basis based on desk research and stakeholder consultations

Rankings for impact and commercial feasibility for the business model frameworks *in the 2 x 2 matrix are based on qualitative assessments from expert and local stakeholder interviews.*

1 Each of the 80 business cases were assessed and ranked on impact potential, economic effectiveness, and ability to scale, based on the criteria below. These business cases were categorised into the broader business models, and an overall score for the model was determined based on average score. The exact nuances of the positions were determined by understanding the different business drivers of the frameworks

Impact ranking was based on direct and indirect impact of business

Direct benefits: estimated mitigation impact and emission reduction	2 points: Impact is certain through avoided deforestation, reforestation and/or forest conservation, and lowering GHG emissions agricultural practices
	1 point: Uncertain impact on lowering GHG emissions because of lack of clear understanding of practices used by business; possible to adopt sustainable practices
	0 points: No GHG emission reduction
In-direct benefits: broader environmental, social and economic	0.5 points: Positive social and economic externalities (e.g. improving air and water quality, increase in jobs and incomes, etc.)
	o points: No indirect externalities

Potential for economic effectiveness rankings were based on commercial feasibility and ability to scale

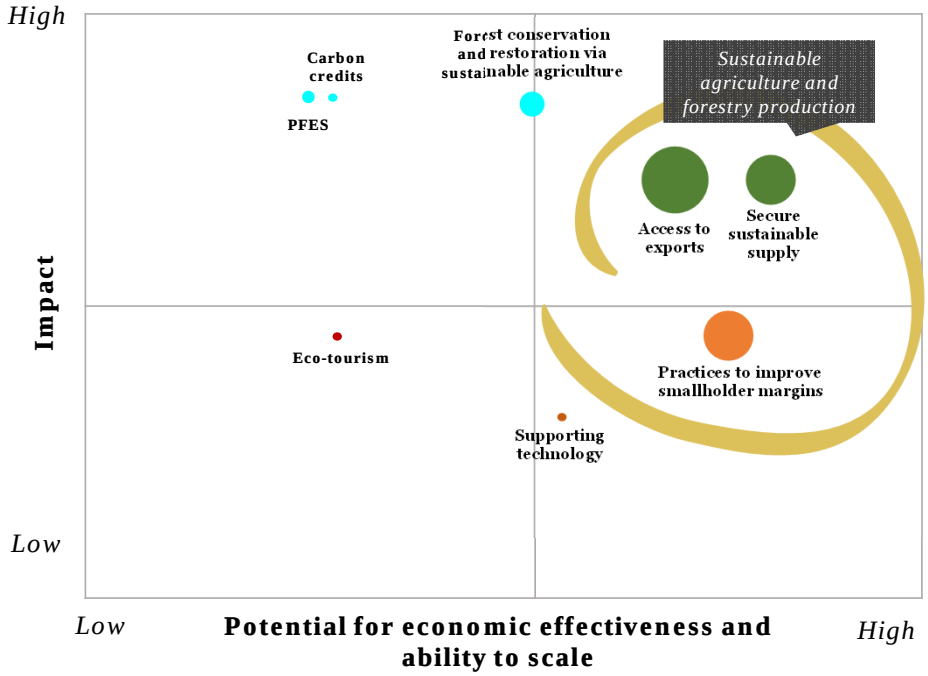
Ability to be commercially feasible and earn returns	2 points: Potential to be commercially feasible with little initial donor support. High ability to pay return on investments
	1 point: Requires donor support for initial capital investments and training costs, however can be commercially sustainable in the long run
	0 points: Requires continuous donor support
Ability to scale to other geographies and commodities	2 points: Already have pilots in different locations, replicable with little iterations based on geographies, stakeholders and commodities
	1 point: Have the ability to scale in different regions and commodities if provided with initial capital and resources
	0 points: Difficult to scale because of specific requirements needed for success of business model

2 Positions of the different models were reassessed and revised based on consultations with participants at the Bangkok workshop in September 2016. Stakeholders were asked to evaluate how we rated the business models, and revisions were made in accordance with the inputs.

Sustainable agriculture and forestry production show the greatest promise for mainstream private-sector engagement, whilst public-private partnerships may be necessary for market building of more nascent models

Impact and profitability of business models[1]

Relative sizes and positioning are illustrative of existing low emission land use management efforts in the region[2]



<u>Ideal for private sector scalability</u>:
- Mainstream sustainable agriculture and forestry production models
- Adopted by MNCs and large domestic companies that have strong market incentives to meet internal ESG/certification requirements to secure procurement or market access; significant balance sheets to invest in sustainability programmes
- Businesses have a good track record with relatively high feasibility

<u>Commercially feasible but lack sustainability awareness</u>:
- Models adopting sustainable agriculture practices to improve smallholder margins; these models are not incentivised by meeting internal ESG or certification requirements
- Adopted by supporting actors in the value chain not involved in production
- Potential for high commercial feasibility, but impact will depend on actual practices

<u>Nascent models for donor market building</u>:
- Reforestation and conservation models for market supply and to provide alternate livelihoods
- Adopted by public and private players interested in sustainability
- Potential for high impact but lack feasibility requiring incubation support and market building activities for larger projects

<u>Niche opportunities</u>:
- Models focusing on conservation through non-production activities; for example, eco-tourism
- Adopted by private players interested in conservation and alternative livelihoods
- Lacks ability to scale, and direct impact on GHG emission reduction is limited outside of niche opportunities

[1] Based on scoring matrix as outlined on slide 19; (see also slides 46-48 in Annex 1). Project-, sector-, commodity- and geographic-specific factors based on local context may affect impact and profitability at the level of the individual project

[2] Based on qualitative assessments from expert and local stakeholder interviews. Bubble sizes represent the number of business cases identified through the market landscape exercise and may not be representative of all existing or potential businesses in SL in the four countries

The appropriateness of models[1], however, are highly local context-specific – with Indonesia and Vietnam having the most identified opportunities, given their current level of development[2] and natural resources

Vietnam

- Policies and enabling environment[3]
- Sector awareness of sustainability
- Stakeholder capacity
- Market dynamics[4]

Philippines

- Policies and enabling environment
- Sector awareness of sustainability
- Stakeholder capacity
- Market dynamics

Cambodia

- Policies and enabling environment
- Sector awareness of sustainability
- Stakeholder capacity
- Market dynamics

Indonesia

- Policies and enabling environment
- Sector awareness of sustainability
- Stakeholder capacity
- Market dynamics

Forestry **Agriculture** **Eco-tourism** **Aquaculture**

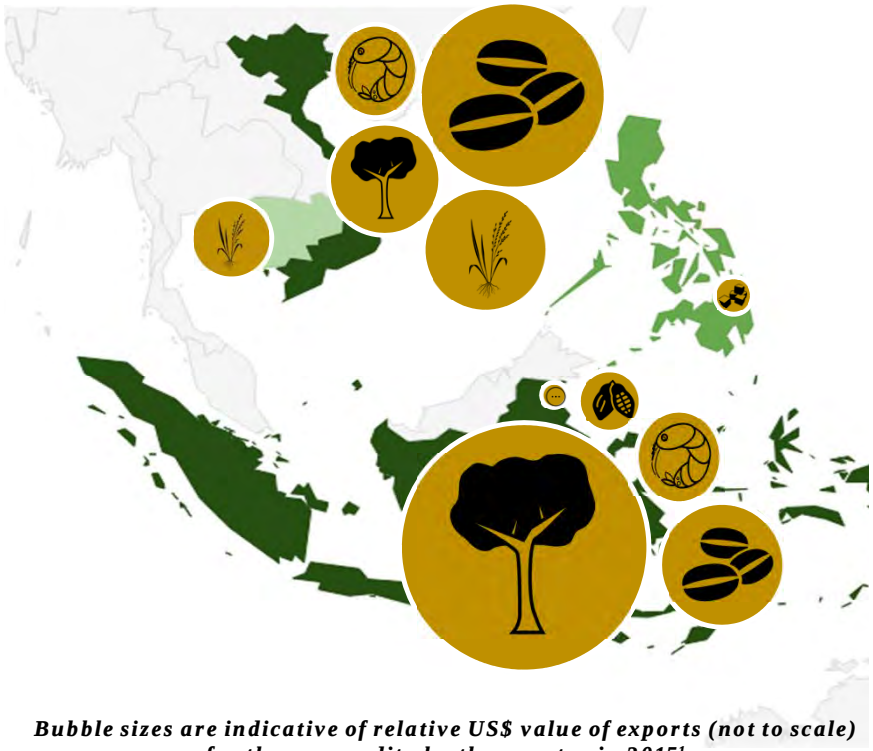
[1] Country assessment is based on expert and local stakeholder interviews and the number of opportunities identified through the market landscaping exercise

[2] **Policy and enabling environment:** degree of government support through policies and government initiatives; **Sector awareness of sustainability:** awareness about sustainability and its practices/benefits in the different sectors; **Stakeholder capacity:** capability of the different stakeholders to be able to adopt sustainability standards; **Market dynamics:** maturity of the market in the agriculture, forestry, fisheries and tourism sector

[3] Based on qualitative stakeholder consultations and AFOLU-LEDS report on AFOLU mitigation in INDCs

[4] Based on qualitative stakeholder consultations and World Bank's 'Ease of Doing Business 2015' index (Vietnam: 90; Philippines: 103; Indonesia: 109; Cambodia: 127)

Among the four countries, Indonesia and Vietnam have the greatest opportunities as they lead the commodity markets focusing on rubber, coffee and rice



Bubble sizes are indicative of relative US$ value of exports (not to scale) for the commodity by the country in 2015[1]

Rice:
- Cambodia exports $335m globally, increasing value of their rice shipments c.215% since 2011
- Vietnam in top 3 of global rice exports and rice consumed in large quantities domestically

Coffee:
- Vietnam exports are at $2.4 billion with Indonesia following at $1.2b

Cocoa:
- There is increase in focus on cocoa in Indonesia by government and the private sector

Rubber:
- Indonesia accounts for c.30% of the world's rubber exports ($4.4b), however, there is low incentive to invest further in this commodity due to depreciation (c.70% in value since 2011)

Sugar:
- Of the countries, Philippines is the largest sugar producer at c.$25m in 2015

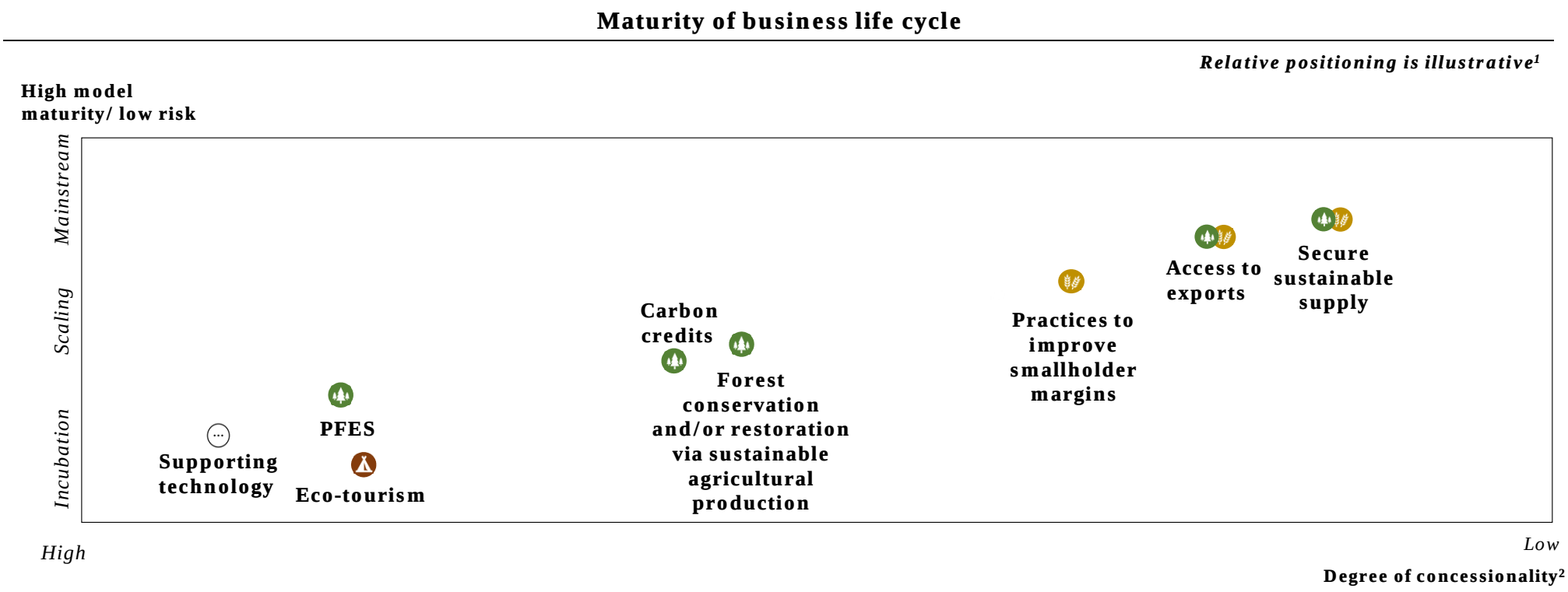
Aquaculture:
- Aquaculture accounts for c.5% of GDP for Vietnam and employs more than four million people[2]

Other:
- Indonesia accounted for 0.3% of the global exports for corn

[1] Source: www.worldstopexports.com
[2] Source: www.worldfishing.net/news101/regional-focus/vietnam-targets-us$7bn-fisheries-exports

Assessment of business models for sustainable landscapes in Asia: Business maturity and potential financial interventions

As donors and private investors look to engage, certain business models may require more concessional (grant) funding to help them incubate and scale; pure-play private capital can target more mainstream opportunities



[1] Based on qualitative assessments from expert and local stakeholder interviews. Relative positioning is illustrative for the general business model; placement of specific case studies within business models is highly dependent on local context and enabling environment

[2] Refers to the degree to which below market rates financing may be required in a steady state for a given business model to succeed. Specific case studies within business models may be at varying stages of the business lifecycle and could require different degrees of concessionality

Assessment of business models for sustainable landscapes in Asia: Business maturity and potential financial intervention

Donors and private sector investors can accordingly tailor financial instruments to tactically address financing needs at the individual project level…

Stage of business lifecycle maturity	Example business models[1]	Potential financial instruments[2]
Incubation – **Nascent and innovative business models with little private sector track record** – Although initial impact of businesses will be minimal, there is potential to impact large populations – Investment is risky because of limited track record and unproved business models	(i) New technologies (ii) PFES	(i) High concessional loans (ii) Grants (iii) VC capital
Scaling – **Proven business models focusing on sustainability ready to absorb capital to scale** – Game-time opportunities since businesses already focus on sustainability and need additional capital to reach scale while being profitable – Capital through traditional means is limited because of long period required to reach breakeven	(i) Eco-tourism (ii) Reforestation and forest conservation through sustainable goods production	(i) Equity (ii) Capex (iii) Impact investments (iv) De-risking/ guarantees (v) Non-financial assistance such as capacity building/TA and access to markets
Mainstream – **Proven business models focusing on sustainability already attracting private sector investment** – Proven to be economically effective while creating impact – Easier to catalyse private sector investment because of low risk of failure – Limited donor additionality since private sector is already engaged	Sustainable goods production for: (i) Secure supply (ii) Access to export market (iii) Improved margins/price premiums	(i) Long-term debt (ii) Equity (iii) Loans from traditional institutions

[1] Based on qualitative assessments from expert and local stakeholder interviews
[2] Financial instruments are typical of the respective maturity stages but are not exclusive to that specific stage of the business lifecycle. See Annex 5 for glossary of financial terms

...alternatively, donor interventions can more broadly catalyse supply-side inflows by de-risking fund portfolios to create attractive risk-return profiles and the scale necessary to crowd-in private capital at greater volumes

	Raising capital	Deploying capital	Managing investment	Exit
	Low market awareness of conservation finance	**Lack of a solid pipeline of investment opportunities; high due diligence costs**	**High transaction costs to manage investments to maintain profitability**	**Limited exit opportunities**
Investor challenges	- Fund managers don't know how to "sell" conservation investments to broader investors, including their benefits and the potential for returns - High investor perception of risk given nascent market, lack of funds/managers with track record - Social impact prioritised over vs. environmental impact	- High transaction costs, given lack of investor ground presence in region, lack of sufficient financial and corporate data for due diligence and lack of sufficient collateral - Mismatch in investor preferences/expectations and market needs for instruments, ticket sizes and returns	- Significant resources (time, money and labour) to oversee investments - Conservation and sustainability models are often not profitable in isolation: often more than one revenue stream required, adding complexity to achieving profitability - Difficulty defining and measuring conservation impact	- Patient (long-term) capital is more appropriate for most investees, but can elongate repayment periods for funds - For equity, exit options are rather limited
Donor mitigation	**Donor signaling as anchor investor to crowd-in private sector capital**	**Co-investment/de-risking to build a portfolio with attractive risk-return profiles and scale**	**Multi-stakeholder capacity building, M&E and connection to networks to deliver returns**	**Market building to facilitate liquidity**

Donors can more effectively catalyse public-private partnerships by mitigating risks at the level of the portfolio fund – instead of on a per project basis – to crowd-in large volumes of private capital that seek returns on investments at a larger scale

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Assessment of business models for sustainable landscapes in Asia: Business maturity and potential financial intervention

There remain several key risks that will continue to hinder access to private sector financing in these sectors; the continued development of the broader ecosystem will help mitigate some of these challenges going forward

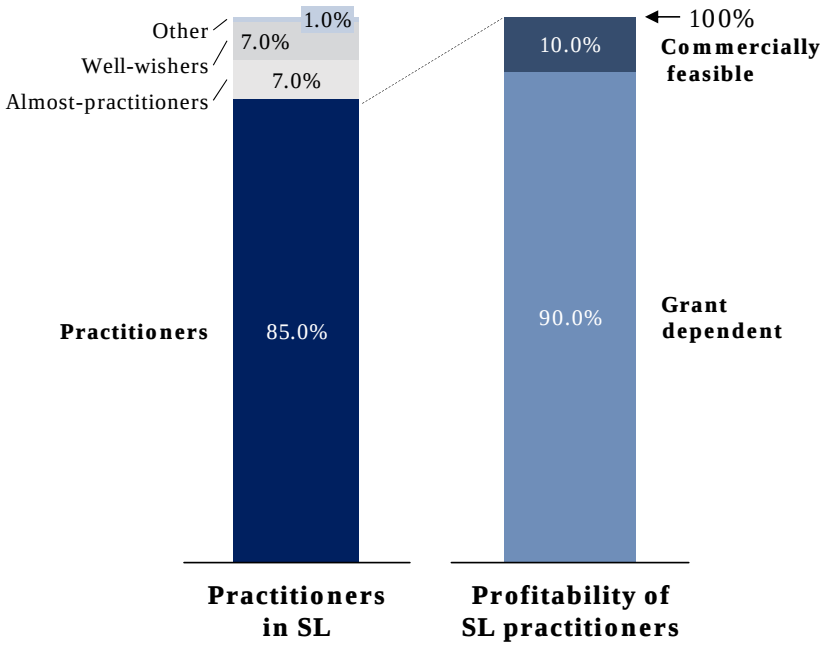
Risks	Mitigants
Macro/micro-economic characteristics The presence of better investments opportunities in the region, including tech-based social ventures, energy and healthcare, coupled with prior poor track record and impression of the AFOLU sectors may keep private finance away	*Generating early success stories that are high impact and financially attractive will help to showcase the viability of investments into the sectors*
Regulatory and policy frameworks Unclear regulatory regimes and/or contradictory policies create uncertainty and open the door to possible corruption. E.g. Unclear definition on protected forest areas in some of the targeted countries hamper efforts to monitor conservation efforts and access to conservation finance	*Multi-stakeholder engagement (e.g., NGOs, large domestic firms, MNCs, etc.) can diversify risk and encourage authorities to clarify regulations*
Social and local community dynamics Local politics, grievances and community differences coupled with uncertain land rights create strong potential for local conflicts that may unsettle potential investments	*Work with NGOs and local aggregators to settle local land rights issues while at the same involving the larger community to share benefits from the project can help to minimise community conflicts*
Geography and biophysical context Poor accessibility due to geographical features in certain areas make it unattractive to investors. Unknown agricultural potential of certain areas may also limit yield improvements needed to generate required returns to investment	*Proper due diligence on investment targets can help to mitigate some of the risk. Also, showing economic feasibility and impact can encourage governments to invest in infrastructure in these areas*

Workshop insights

Assessment of business models for sustainable landscapes in Asia: Insights from USAID/RDMA workshop

There was a broad mix of participants across sectors at the USAID/RDMA workshop; donor-funded SL practitioners still formed the large majority, with a small minority of commercially successful practitioners

Mix of participants at USAID/RDMA workshop[1]
%, n=83



Despite c.90% of SL practitioners at the workshop being donor-funded, there was still significant optimism for private sector engagement in the SL space[1]...

- *c.90% were excited or conditionally excited about the SL space...*
- *...with c.5-10% sceptical about private-sector engagement in SL*

"There is a lot of knowledge in this room as most of the people are already practitioners in the sustainability space"

...and with c.10% of SL practitioners self-identified as commercially feasible, participants emphasised the need to share learnings and discuss how to work together to address challenges

"There aren't many commercially feasible ventures however there are some, emphasising that it is possible to be commercially sustainable in this sector. There are ventures everyone can learn from at this workshop"

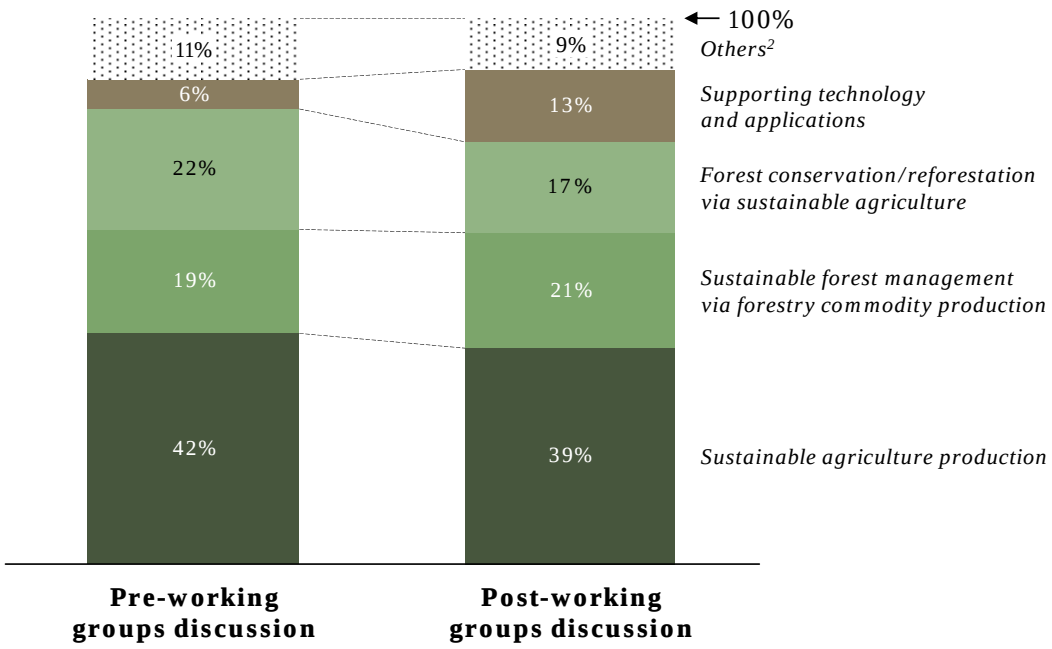
"Given the number of practitioners, it is important for participants to think beyond vested interests and try to discuss challenges and opportunities witnessed in the sector"

[1] Participants at the USAID/RDMA workshop in Bangkok on 26 September 2016 were each asked to move around the room to self-identify on three dimensions: (i) are they practitioners in the SL space, almost-practitioners, well-wishers, or other; (ii) if practitioners, were projects grant-dependent or commercially feasible; and (iii) are they excited, conditionally excited, or sceptical about private sector engagement in SL. Percentages are based on estimates of the number of people in each grouping

Participants were most excited about sustainable agriculture and forestry production—in line with findings from the field visits—but believed integrating business models together is important to achieving scale

Allocation of hypothetical funds across business models[1]

%; n=73 pre-discussion, n=64 post-discussion



Sustainable commodity production had the most interest (c.77%) from workshop participants…

- Sustainable practices in agriculture and forestry production were evenly-split amongst participants:
  - Sustainable agriculture practices via sustainable agriculture production (c.39%)
  - Sustainable forestry management and forest conservation/ reforestation via commodity production (c.38%)
- These remained relatively unchanged after the case study discussions in working groups

…but integrating business models together is viewed as integral to achieving commercial feasibility and scale

- Participants do not believe that business models should be considered in isolation
- Case studies may be cross-cutting across several business models, which many participants view as necessary to achieving profitability and scale
- Supporting technology, applications and systems was viewed as important for facilitating the implementation of other business models

[1] Participants at the USAID/RDMA workshop in Bangkok on 26 September 2016 were each asked to allocate a hypothetical US$10m in funds across a portfolio of their top two preferences for business models both before and after case study working group discussions. This hypothetical allocation is not meant to represent how funds should be broken down within a potential portfolio, but rather is indicative of participants' interest in specific business models and their potential role in a future SL programme

[2] 'Others' includes PFES for watershed management (pre: 5%, post: 4%), eco-tourism (pre: 5%, post: 3%) and forest conservation/reforestation for offsets trading (pre: 1%, post: 2%)

Going forward, many participants stressed the importance of getting a deeper understanding of financials to prove commercial feasibility whilst not side-lining the focus on 'landscapes' and impact in the search for scale

Key considerations for future analyses[1]

Detailed commercial feasibility analysis	- **More financial information** and financial modelling to understand potential returns (e.g., profit margins, IRR, etc.) for all stakeholders/investors involved and to prove underlying commercial viability - Explore **potential for other financial intermediaries** such as banks, venture capital funds, MFIs to participate in the different initiatives to improve financial viability of model - Increase **funding in de-risking mechanisms** (development credit, etc.) and simplify requirements to ensure understanding and uptake of guarantees
Stronger focus on impact	- **Impact focus should not be side-lined in search for commercial returns and scale**; a minimum requirement for GHG emission reduction can be used as a reference point for all projects - For an SL programme, it is essential to **focus on broader 'landscapes' rather than piecemeal projects** that may have limited scale and impact, as well as differentiate between impact on protected forests versus forest concessions - **Urgency around at-risk landscapes should be included as a criteria** in the assessment matrix to ensure that business models with conservation/avoiding deforestation are prioritised, given the greater potential for GHG emissions reduction
Other considerations	- **Prioritise focus sectors and models to scale impact versus diffusing funds too thinly**; this has to be balanced with investing more broadly to understand what is out there and test what works as it may be **too early to choose winners** - Further **analysis of project risks** for various stakeholders and potential strategies to mitigate these risks - This study is deepening the understanding of business models in a nascent SL space (reminiscent of the clean energy space c.20-30 years ago); there is a need to **support pipeline by incubating/accelerating players and convening stakeholders**

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016. This is not an exhaustive list of all comments, but represents common themes expressed by participants during the workshop plenary sessions and facilitated working group discussions

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Participants believe donors and multilaterals should take a holistic approach to the SL space by funding a range of capacity building, financial de-risking and convening platform/incubator interventions…

	Role for donors and multilaterals[1]
Capacity building and technical assistance	- **Institutional capacity building and incubation support** (e.g., helping business enterprises to create business plans to operationalise these models to achieve their commitments; support implementing NGO with capacity building to develop farmer skills and to meet ESG and certification requirements)
Financial interventions	- **De-risking capital** or loan guarantees to support prototyping and demonstration of effective enterprises that can achieve climate change goals and generate commercial returns at the same time - **Patient (long-term) capital** as many SL business models require longer-term investments before being able to breakeven and scale; many current donor-funded programmes are timeline constrained and unable to see projects through completion
Convening platform	- **Set up a convening platform** to facilitate stakeholder collaboration and discussion on similar models to create greater market incentives for stakeholders to invest in securing green and sustainable supply chains - **Connect smallholder farmers with off-takers** to strengthen incentives for smallholders to participate in the project and get assured returns
Impact monitoring and evaluation	- **Support monitoring and evaluation** and impact assessment of projects to ensure projects have clearly defined GHG emissions reductions impact and to generate learnings for commercial scalability and replication

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016. This is not an exhaustive list of all comments, but represents common themes expressed by participants during the workshop plenary sessions and facilitated working group discussions

...and many are keen to engage in building upon the study's learnings and supporting these interventions in a future SL programme

Participants: 'What I can do...'[1]

Capacity building and technical assistance

Support development of PPPs in forests; impact investment fund managed by Palladium and McKinsey for DfID (c.US$76m in financing, c.US$26m in TA)

- ***Wiwik Widyastuti, Partnerships for Forests***

Introduce sustainable and deforestation-free commitments and support companies and smallholder farmers through training and access to finance

- ***Richard McNally, SNV***

39 participants

Financial interventions

Manage a US$50m fund to invest in sustainable landscapes in Indonesia

- ***Agus Sari, Belantara Foundation***

Convert c.US$5m in donor funding to c.US$20m in private capital by fundraising with family offices and high net worth individuals as an impact investor in Vietnam

- ***James Bui, Lotus Impact***

Create a fund that provides first-loss guarantees to banks to lend long-term in Cambodia

- ***John McGinley, Mekong Strategic***

4 participants

Convening platform

Convene c.3k practitioners through the Global Landscape Forum meeting in May 2017 in Jakarta

- ***Philippe Guizol, CIFOR***

Bring together the private sector, government, and civil society to co-create and co-implement value chain projects

- ***Alison Eskesen, Grow Asia Partnership***

Create markets for conservation services and emissions reductions by connecting corporate pledges to sustainable landscapes

- ***Gabriel Eickhoff, Forest Carbon***

17 participants

[1] Based on 'What I can do...' worksheets completed (n=52) by participants at the USAID/RDMA workshop in Bangkok on 26 September 2016. Participants were able to suggest engaging across multiple categories. Examples provided are not exhaustive, but are meant to exhibit the range of possibilities for support in a future SL programme. See Annex 6 for participant worksheets

Frequently asked questions (1/2)

How applicable is this study to Thailand (or other geographies)?

Although there are local context-specific factors that may affect implementation of business models across the different geographies, many of the overarching learnings from this study (i.e., stakeholder incentives, interactions, risks and challenges, etc.) are broadly cross-cutting regionally. This study should be used as a basic template for a business model with the understanding that further due diligence is required before project feasibility in any given local context can be determined

Why has palm oil been excluded from the study?

USAID/RDMA has specifically excluded palm oil from the scope of this study

Why is rice included as a commodity from an impact perspective?

Rice highly contributes to GDP and is responsible for the highest GHG emissions in Asia developing countries. Lowering emission from rice production is consistent with USAID's Sustainable Landscape strategy that includes management of forests, agricultural areas, and other inter-connected ecosystems to reduce GHG emissions, enhances carbon storage, and provides other benefits for human well being.

Is there scope for integration of different business models?

Yes. This study elaborates on seven business models to show the nuances between different types of private-sector returns for SL management and the incentives for the different stakeholders. In practice, many business cases are cross-cutting across the different business models

How do the different business models perform under different enabling environments?

Although there are local context-specific factors that may affect implementation of business models across the different geographies, many of the overarching learnings from this study (i.e., stakeholder incentives, interactions, risks and challenges, etc.) are broadly cross-cutting regionally. This study should be used as a basic template for a business model with the understanding that further due diligence is required before project feasibility in any given local context can be determined

Frequently asked questions (2/2)

Why has supporting technologies been included as a separate business model?

Supporting technologies is an over-aching business model type that can be utilised in all the other business models. However, supporting technologies has been included as a separate business model framework to emphasise the importance and growth of technological innovations and data capturing to facilitate sustainable landscapes

Why is there focus only on Western export markets and not on regional markets?

Currently, there is a focus on export markets insomuch as they demand certification and/or ESG-compliant produce. There are fewer niche opportunities for certified and/or ESG-compliant produce in domestic/regional markets. Rather than ignoring regional markets, these are viewed as longer-term plays

How did the Dalberg team come up with the mentioned 7 business models?

A brief summary of the structure adopted to reach the 7 business models is explained in slides 8-14. (NB: in this revised version of the report, there are now 8 business models).

How were the business model frameworks rated on impact and commercial feasibility?

Based on qualitative assessments from expert and local stakeholder interviews. Relative positioning is illustrative for the general business model; placement of specific case studies within business models is highly dependent on local context and enabling environment. Since the positioning reflects an overall understanding of the different business models, there might be examples of certain companies/ businesses that fall under a particular business model framework but have different impact or commercial feasibility than what is reflected for the business model

How does one define ‘quick win’?

A quick win is defined as a high-value, investible opportunity that can be helped to reach scale or be commercially viable in the shorter-term. These are opportunities that donors can help catalyse private sector capital more immediately

Participant list for USAID/RDMA workshop in Bangkok on 26 September 2016 (1/4)

Country	Name	Organisation	Title
Indonesia	Agnes J Safford	GreenWorksAsia	Managing Director
Indonesia	Agus Pratama Sari	Belantara Foundation	CEO
Thailand	Alan Dale Gonzales	Full Advantage	Executive Director
Indonesia	Alex Manoogian	Mercy Corps	
UK	Alexandra Pinzon	Global Canopy Programme	Project Lead
Singapore	Alison Eskesen	Grow Asia Partnership	Director, knowledge and accountability
Philippines	Alma Porciuncula	DAI Global	Technical Specialist
Indonesia	Andi Ikhwan	Mercy Corps	Program Director
USA	Andrew Kaiser	Kaizen Company	Managing Director
Thailand	Aurelia Micko	USAID RDMA	Deputy Director, Regional Environement Office
Germany	Axel Walter Wildner	Embassy of Germany, Bangkok	Counsellor of Food and Agriculture
Thailand	Barry Flaming	PACT	Deputy Chief of Party
Thailand	Beau Damen	FAO	Natural Resources Officer
London	Benhan Limketkai	Dalberg	Manager
Thailand	Bikram Ghosh	AECOM	Chief of Party
Vietnam	Brian Bean	Winrock International	Chief of Party, USAID Vietnam Forests and Daltas
	Brian Cohen	Integra	Vice president
Myanmar	Cavelle Dove	MEDA	Country Project Manager Myanmar
Indonesia	Charlotte Mack	Abt. Associates	Adaptation and Resilience specialist
LAO PDR	Christopher Holmes	Wildlife Conservation Society	Regional Director

Participant list for USAID/RDMA workshop in Bangkok on 26 September 2016 (2/4)

Country	Name	Organisation	Title
Thailand	Christopher La Fargue	USAID RDMA	Climate Change Team Lead
Thailand	Cristy Owen	Pact	Chief of Party, USAID Mekong Partnership for Environment
Philippines	Daniel Martinko	DAI, Asia region	
India	Deepak Awari	Louis Berger	Deputy Director – Business Development and Operations
Thailand	Diana Almoro	UNEP Finance Initiative	Regional Coordinator
Vietnam	Do Trong Han	World Agroforestry Centre	Research Officer
Indonesia	Gabriel Eickhoff	Forest Carbon	Managing Director
	Gilbert Salamanc		
Thailand	Gordon Congdon	WWF- Thailand	Conservation Programme OFficer
Indonesia	Indira Nurtanti	Tetra Tech	Private Sector Engagement
Vietnam	James Dien Bui	Lotus Impact	Managing Partner
Thailand	Joel Scriven	UNDP	Regional Technical Specialist
Thailand	John Bruce Wells	USAID Low Emissions Asian Development (USAID LEAD) program / ICF	Chief of Party, USAID Low Emissions Asian Development (USAID LEAD)
Cambodia	John McGinely	Mekong Strategy	
Cambodia	John Wills	Wildlife Alliance	Director of Programs
Thailand	Jonathan Gilma	UNEP Finance Initiative	Regional Development Coordinator
South Korea	Juhern Kim	Global Green Growth Institute	Senior Land-Use Specialist, Investment & Policy Solutions Division
India	Kanika Arora	Dalberg	Senior Consultant
Vietnam	Kathy Julik-Heine	Deloitte Consulting LLP	Senior Consultant
USA	Kennth Adrasko	LEDS AFOLU Working Group	Co-chair, AFOLU working group

Participant list for USAID/RDMA workshop in Bangkok on 26 September 2016 (3/4)

Country	Name	Organisation	Title
Thailand	Kim Deridder	The Asia Foundation	Diirector of Environment Program
Thailand	Kongpichit Na-Nakhonphanom	Control Union	Country Director
Vietnam	Le Thu Hien	The Asia Foundation	Program Manager
Thailand	Maja Forslind	SIDA	Programme Manager, Private sector colloboration
Indonesia	Maria Cristina Guerrero	NTEP-EP Asia	Senior Advisor for Strategic Programs
Thailand	Marianne Smallwood	USAID RDMA	Regional Partnerships Builder
Thailand	Marija Kono	SilvaCarbon	Regional Coordinator
Netherlands	Martin Greijmans	RECOFTC	Senior Program Advisor
Indonesia	Mathew Leggett	Wildlife Conservation Society	Regional Advisor
Philippines	Melody Faye T. Florendo	Development Finance International, Inc	Senior Associate
Thailand	Michael Sheinkman	CCAFS/ CGIAR	Climate change, agriculture and food security
USA	Mikell O-Mealy	ABT Associates	Seniro Associate
Indonesia	Muhammad Ery Wijaya	Climate Policy Initiative	Senior Analyst
Thailand	Natcha Tulyasuwan	USFS	Sustainable Landscape Expert
Thailand	Nichapat Na Thalang	WWF-Thailand	Corporate Stewardship
Cambodia	Nico Strydom	Grandis Timber	CEO
Thailand	Nontaya Krairiksh	Global Green Growth Institute	GHG and Sustainability Manager
Thailand	Pete Cutter	SERVIR- Mekong	Science and Data Co-lead
Thailand	Peter Dupont	USAID RDMA	Climate Change Advisor
Philippines	Philip DeCosse	Engility Corperation	

Participant list for USAID/RDMA workshop in Bangkok on 26 September 2016 (4/4)

Country	Name	Organisation	Title
Indonesia	Philippe Guizol	CIFOR	Team Leader for Value Chains, Finance and Investment
India	Pratiksha Barasia	Dalberg	Analyst
Thailand	Rachel Zedeck	Control Union	Director
Singapore	Rajen Makhijani	Dalberg	Partner
Indonesia	Reed Merrill	Tetra Tech	USAID Lestari's Chief of Party
Thailand	Regan Suzuki Pairojmahakji	RECOFTC	Associate: People Forest and Climate change
India	Richa Sharda	Dalberg	Senior Consultant
Vietnam	Richard Mcnally	SNV	Global Coordinator REDD+
Germany	Saija Muller	Embassy of Germany, Bangkok	
Thailand	Sandra Khananusit	CEADIR	Partner Engagement Speciailist
USA	Sarah Marlay	USFS	Asia-pacific Program Specialist
Denmark	Shauna Matkovich	IWC	Investment Manager
Thailand	Soojin Kim	FAO	Natural Resources Officer on Climate Change
	Sue Heim Hieto	South Pok Group	
Thailand	Suphasuk Pradubsuk	USAID RDMA	Program Development Specialist
Thailand	Suriyan Vichitlekarn	GIZ	Program Director
Vietnam	Terhi Majanen	USAID/Vietnam	
Australia	William McGoldrick	Nature Conservancy	Director, Government relations
Indonesia	Wiwik Widyastuti	Partnership for Forests	SE Asia Communication
Thailand	Yord Thaviphoke	Chemonics International	Regional Director

Assessment of business models for sustainable landscapes in Asia: Suggestions for future research

Based on the research limitations, key findings and inputs obtained from the workshop, opportunities for further research include:

- Studies with comprehensive data verified by independent third parties on investment profitability and activities with mitigation potential from individual corporations could enrich the assessment of the investment strategies
- Although the research elicited linkages between shrimp and mangrove with implications for coastland management, the study draws primarily on data derived from single commodity perspective. The linkages between different commodities, at a landscape level, could be further explored.
- The role of environmental certification schemes were included in this study. Given its potential to apply at a wider scale, and inclusion of GHG emissions reduction as one of the indicators, an in-depth study looking at potential corporations to apply the target alongside appropriate schemes to include GHG emission reduction could bring valuable insights.
- As the research focuses on 4 countries in Asia, a larger number of countries in the region should be investigated. Similarly a more diversity of interviewees selected from a wider pool of knowledge informants should be considered. Additional data and analysis would help determine the extent to which the findings could be transferred to other contexts.
- Although emphasis was made to areas with limited attention in current empirical studies, further investigation could include oil palm to capture cross-commodity and landscape level dynamics between oil palm and other commodities.

Summary of knowledge briefs

USAID FROM THE AMERICAN PEOPLE

Dalberg

We short-listed 12 case studies as high-value opportunities in which donors can drive private sector impact in sustainable landscapes through a range of financial and capacity-building interventions (1/3)

Case study	Business model		Case study description	Impact (ha)[1]	ER potential (tCO2e/yr)[1]	Breakeven period (years)[2]	Commercial feasibility
1	3	Sustainable agricultural production for meeting internal targets and/or securing supply chain	**Unilever** is procuring sustainably grown certified tea in **Vietnam**, in partnership with the Sustainable Trade Initiative (IDH) and Rainforest Alliance	c.70k	c.700k	c.1-2 years	High costs of US$2.5M to train and certify 20k farmers, with potential to generate profits within 2-3 years
2	1	Sustainable agricultural and forestry commodity production to reduce reputation risk and/or access to export	**Rocky Mountain** in **Philippines** is engaging small holder farmers to convert their current land use to sustainable, more productive Arabica coffee plantations to be able to access export markets	c.3.7k	c.6-7k	c.5 years	High upfront costs of $6.9M for 1000 ha and gross profit margins of over 30% after first three years
3	2	Sustainable agricultural production for increasing smallholder market size client/borrowers by improving smallholders' credit worthiness and/or margins	**Bank Andara** in **Indonesia**, in partnership with Syngenta and Mercy Corps, is investing to improve SMF margins by helping them adopt 'good agriculture practice' & facilitating access to finance through branchless banking to make them more attractive customers	c.1.5k	c.1k	c.1 year	Upfront training costs of US$ 75k for 6.5k ha for a cycle with potential to return a positive return for the bank in 8-9 months
4	1	Sustainable agricultural and forestry commodity production to reduce reputation risk and/or access to export	**The Borneo Initiative** (and other partners) provide financial and technical support to timber concessions in **Indonesia** to apply for FSC certification to access export markets	c.1.4m	c.8.6m	c.5-7 years	High certification costs of US$1.1m per 100k hectares; Potential to recover with an average price premium of 12 % within the validity period (5 yrs.)

[1] Refer to respective case study knowledge briefs for assumptions and calculation of impact and emissions reduction potential
[2] Based on stakeholder consultations

USAID FROM THE AMERICAN PEOPLE Dalberg

We short-listed 12 case studies as high-value opportunities in which donors can drive private sector impact in sustainable landscapes through a range of financial and capacity-building interventions (2/3)

Case study	Business model		Case study description	Impact (ha)[1]	ER potential (tCO2e/yr)[1]	Breakeven period (years)[2]	Commercial feasibility
5	1	Sustainable agricultural and forestry commodity production to reduce reputation risk and/or access to export	**Kfw** in **Vietnam** provided a grant loan to the government to reforest plantation forests over 10 years	c.48k	c.150k	c.10+ years	High upfront cost of replantation activities, and farmer capacity development
6	4	Forest conservation via sustainable agricultural production for niche domestic market and/or export market	**Minh Phu** is **Vietnam** is promoting an integrated mangrove-shrimp aquaculture project to procure certified shrimp to access export markets through the Mangroves and Markets project	c.2.7k	c.40k	c.2 years	High programme costs of c.US$130k comprising certification and farmer training costs, with potential to generate profits within 1-2 years
7	4	Forest conservation via sustainable agricultural production for niche domestic market and/or export market	**WCS** in **Cambodia** is working to help farmers produce high-quality rice (IBIS rice)	c.3.1k	c.45k	c.7	Accumulated losses of US$75k for 2015 due to high costs and low rice revenues. Slowly moving towards greater operational profitability
8	4	Forest conservation via sustainable agricultural production for niche domestic market and/or export market	**WWF** in **Indonesia**, in partnership with private sector stakeholders and donors, is helping farmers produce sustainable coffee and increase incomes to prevent them from encroaching into the nearby Park Areas	TBD	n/a	TBD	Potential for self sustainability within medium term with participation of a private sector off taker

[1] Refer to respective case study knowledge briefs for assumptions and calculation of impact and emissions reduction potential
[2] Based on stakeholder consultations

We short-listed 12 case studies as high-value opportunities in which donors can drive private sector impact in sustainable landscapes through a range of financial and capacity-building interventions (3/3)

Case study	Business model		Case study description	Impact (ha)[1]	ER potential (tCO2e/yr)[1]	Breakeven period (years)[2]	Commercial feasibility
9	5	Watershed management to secure water resources via PFES	**Manila Water** in the **Philippines** pays a performance-based fee to SMFs to reforest and conserve watershed areas from where it sources water	c.2.7k	c.7-8k	c.15+	Direct long term impact on water supply and filtration costs for private sector companies that needs to be quantified
10	6	Forest conservation and restoration for offsets trading	**PT RMU**, an **Indonesian** private sector company, has invested in reforestation of an ecosystem restoration concession to earn returns through sale of carbon and conservation offsets in compliance with regulatory and voluntary markets	c.200k	c.2.5m	Long term	Potential for the fund to earn a return of 5% (still to be tested) in the short run, as enabling factors become favourable
11	7	Forest conservation via eco-tourism	**Wildlife Alliance** is running a successful community based eco-tourism model in Chi Phat province in **Cambodia**	c.100k	c.1.3-4.3m	c.8-9	High initial investment of US$200k, with high operations costs and low tourism revenues in initial years
12	8	Technology, applications and systems to support GHG emissions reduction	The **Philippines Biochar Association** wants to create a profitable community based enterprise will buy biochar from small holder farmers and sell to mines and other organizations doing reforestation.	Not relevant	Potential to offset a maximum of 12% of GHG emissions per year (1.8 PgCO2e/yr.)	c.2	Low upfront costs of c. $600K and strong margins of c. 50%. Downside risk of market assumptions may reduce returns

[1] Refer to respective case study knowledge briefs for assumptions and calculation of impact and emissions reduction potential
[2] Based on stakeholder consultations

Annexes

Annex 1: Methodology

Annex 1: Research objectives and study methodology

*The research objective of this study is to **identify high-value business models that support sustainable landscapes** in Cambodia, Indonesia, the Philippines and Vietnam – with broader scalability across the region*

Research objectives

- **Describe 12 existing or potential business models and case studies**: these include implementing best practices in commercial agriculture, changing to lower emissions/higher carbon storage crops, and emissions/higher carbon reduction activities, such as reforestation/restoration, etc.
- **Outputs of the projects** will be used to:
  - (i) serve as an input for an investment/finance in sustainable landscapes workshop
  - (ii) further USAID/RDMA's knowledge and understanding of existing investable business models

In-scope

- Development of a rigorous selection and assessment criteria
- Market scan for businesses/organisations/programmes in the relevant space
- Database of businesses/organisations/programmes by sector and commodity
- Review of business models and case studies, as available, to understand conservation potential and commercial viability
- Review financial sustainability of business models if they employ sustainable landscapes practices
- Develop knowledge notes for 12 business models and case studies

Annex 1: Research objectives and study methodology

We performed a micro-analysis in the four countries using a three-part primary and secondary research methodology to validate findings and landscape the market for a pipeline of scalable SL opportunities

Desk research

We leveraged internal resources and external publically-available research reports and resources to develop an understanding of fundamental market dynamics:

Internal sources:

- Past Dalberg project work (USAID Sustainable Landscape Financing, Study on the Applicability of Results-Based Financing Mechanisms for REDD+, Initiative for Smallholder Finance, etc.)

External sources:

- Other organisations/programmes (UN-REDD Programme, IDH Sustainable Trade Initiative, Forests Asia Summit, Global Landscapes Forum, etc.)
- Other external desk research reports (World Bank, IFC, UN, FAO, CIFOR, Credit Suisse, etc.)

Expert interviews

We will conduct a series of interviews with USAID RDMA and Dalberg country experts to help understand sustainable landscapes and the local context:

USAID/RDMA content experts:

- Climate change and environment/forestry specialists
- In-country bilateral missions

Dalberg:

- Yana Kakar, Global Head of Agriculture and Food Security practice
- Sonila Cook, Global Head of Energy and Environment practice
- Serena Guarnaschelli, Innovative finance specialist
- Dalberg industry contacts

In-country field visits

We spoke with c.70 key individuals during in-country visits, including (i) local entrepreneurs and key industry players, (ii) NGOs and implementation partners, (iii) financial intermediaries and investors, (iv) government stakeholders and (v) other experts to validate findings and identify potentially scalable business models in:

- Cambodia
- Indonesia
- Philippines
- Vietnam

Annex 1: Research objectives and study methodology

An initial set of c.80 case studies were identified and qualitatively assessed on impact potential, economic efficiency and effectiveness, innovation and scalability and the presence of a favourable environment. Ranking for impact and commercial feasibility for the business model frameworks in the 2x2 matrix are based on qualitative assessments from expert and local stakeholder interviews.

1 Each of the 80 business cases were assessed and ranked on impact potential, economic effectiveness, and ability to scale based using the criteria below. These business cases were categorised into the broader business models and an overall score for the model was determined based on average score. The exact nuances of the positions were determined by understanding the different business drivers of the frameworks

Impact ranking was based on direct and indirect impact of business

Direct benefits: estimated mitigation impact and emission reduction	2 points: Impact is certain through avoided deforestation, reforestation and/or forest conservation, and lowering GHG emissions agricultural practices
	1 point: Uncertain impact on lowering GHG emissions because of lack of clear understanding of practices used by business; possible to adopt sustainable practices
	0 points: No GHG emission reduction
In-direct benefits: broader environmental, social and economic	0.5 points: Positive social and economic externalities e.g. improving air and water quality, increase in jobs and incomes etc.
	o points: No in-direct externalities

Potential for economic effectiveness rankings were based on commercial feasibility and ability to scale

Ability to be commercially feasible and earn returns	2 points: Potential to be commercially feasible with little initial donor support. High ability to pay return on investments
	1 point: Requires donor support for initial capital investments and training costs, however can be commercially sustainable in the long run
	0 points: Requires continuous donor support
Ability to scale to other geographies and commodities	2 points: Already have pilots in different locations, replicable with little iterations based on geographies, stakeholders and commodities
	1 point: Have the ability to scale in different regions and commodities if provided with initial capital and resources
	0 points: Difficult to scale because of specific requirements needed for success of business model

2 Positions of the different models were reassessed and revised based on consultations with participants at the workshop (in September 2016, in Bangkok). Stakeholders were asked to evaluate how we rated the business models and revisions were made in accordance

Annex 1: Selection and assessment criteria

With more time and resources, the initial set of c.80 case studies could be further identified and qualitatively assessed based on the following sub-criterion and assessment factors[1](1/2)

Criteria	Definition	Sub-criteria	Assessment factors
1. Impact potential	*Potential of the project to contribute to emissions reductions through sustainable landscapes in USAID priority areas*	Estimated mitigation impact and emissions reductions	Expected tonnes of carbon dioxide equivalent (t CO2 eq) to be reduced or avoided
			Expected improvement in the management of land or forest areas contributing to emissions reductions
			Degree to which expected impact is transparent, traceable and repeatable
			Qualification of other relevant assessment factors, taking into account USAID objectives and priorities (sectors, geographies, etc.), if relevant
	Broader environmental, social and economic co-benefits, excluding emissions reductions	Expected positive environmental co-benefits	Potential for positive environmental externalities, including air quality, soil quality, biodiversity, etc.
		Expected positive social co-benefits	Potential for positive social externalities, including in cultural heritage, education, gender, health, regulatory, etc.
		Expected positive economic co-benefits	Potential for positive economic externalities, including enhanced job markets, job creation, poverty alleviation, increase in productivity and competitive capacity, etc.
2. Economic efficiency and effectiveness	*Economic and financial soundness of the project and additionality of USAID intervention*	Project financial viability and expected rate of return	Economic and financial rate of return
		Cost-effectiveness of mitigation impact	Estimated cost per t CO_2 eq (total investment cost/expected lifetime emissions reductions), as compared to other comparable opportunities
		Implementation of industry best practices	Qualification of application of best available technologies and/or best practices
		Financial adequacy and appropriateness of donor intervention	Qualification that proposed financial structure and donor intervention is adequate to achieve project objectives, including addressing existing bottlenecks and/or barriers and provides the least concessionality needed to make project viable
		Potential to catalyse and/or leverage additional private sector investment	Expected volume of private sector finance to be leveraged by project as a result of donor's financing
			Co-financing ratio (total amount of co-financing/donor's investment in project)

[1] We assessed each case study based on qualitative data from stakeholder discussions and incorporated quantitative data, where available, to conduct an initial high-level screening for the purposes of prioritising business models. These criteria, adapted from the investment criteria for the Green Climate Fund, can be used to structure more detailed due diligence processes on a per-project basis

Annex 1: Selection and assessment criteria

With more time and resources, the initial set of c.80 case studies could be further identified and qualitatively assessed based on the following sub-criterion and assessment factors[1](2/2)

Criteria	Definition	Sub-criteria	Assessment factors
3. Innovation and scalability	*Degree to which the project can catalyse impact beyond a one-off project or investment (i.e., potential for scaling up and replication)*	Capacity for innovation	Qualification of opportunities for targeting innovative solutions, new market segments; developing or adopting new technologies, business models, modal shifts and/or processes
		Potential for expanding the scale and impact of the proposed project (scalability)	Potential for scaling up the scope and impact of the project without equally increasing the total cost of implementation
		Potential for applying structural elements of the project elsewhere (replicability)	Potential for replication of the proposed activities in the project in other sector, organisations, geographies, communities, or countries
		Market development and transformation	Extent to which the project creates new markets and business activities at the local or national levels and/or degree to which the project will change incentives for market participants by reducing costs and risks, eliminating barriers to sustainable landscapes solutions
4. Other assessment factors	*Country capacity to implement sustainable landscapes projects through existing policies, climate strategies and institutions*	Existence of national climate strategy and existing policies	Degree to which the project is supported by a country's enabling policy and institutional framework with respect to climate change and sustainable landscapes
		Governance and enabling environment	Quality of enforcement and governance of policies and regulations frameworks; degree to which business climate is attractive to investors
	Complementarity to sustainable landscapes programming in respective USAID bilaterial missions	Complementarity to existing USAID sustainable landscapes programmes	Degree to which project complements and strengthens the sustainable landscapes programming of the respective USAID bilateral missions
	Capacity of partner or executing entities to deliver	Existence of partners	Degree to which project has identified willing, like-minded, prepared-and-close-to-action partners
		Partner experience and track record in delivering proposed project	Demonstration of consistent track record and relevant experience and expertise in similar or relevant circumstances (e.g., sector, type of intervention, technology, etc.)
		Risk management strategy of partner	Qualification of risk management strategy of partner and ability to navigate project-, regulatory-, stakeholder-specific risks, etc.
		Extensive stakeholder consultations and engagement	Degree to which project and/or partner has consulted with local civil society groups and other relevant stakeholders

[1] We assessed each case study based on qualitative data from stakeholder discussions and incorporated quantitative data, where available, to conduct an initial high-level screening for the purposes of prioritising business models. These criteria, adapted from the investment criteria for the Green Climate Fund, can be used to structure more detailed due diligence processes on a per-project basis

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (1/6)

Industry associations

Country	Organisation	Name	Title
Indonesia	**PISAgro**	Danumurthi Mahendra	Executive Director
Indonesia	**Grow Asia**	Reginald Lee	Manager for Country Partnerships
Philippines	**Philippine Biochar Association**	Anita Celdran	Executive Director
Philippines	**Philippine Sugar Mill Association**	Edna Tatel	Environment/Energy Affairs Officer
Philippines	**Philippine Biochar Association**	Philip Caldran	Director
Philippines	**Chambers of Commerce**	Jose Yulo	President
Global	**Forest Stewardship Council**	Alistair Monument	
Global	**International Tropical Timber Organization**	Dr. Tetra Yanuariadi	Project Manager, Division of Trade and Industry

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (2/6)

Companies

Country	Organisation	Name	Title
Indonesia	**Rimba Makmur Utama**	Dharsono Hartono	CEO
Indonesia	**Olam**	Moray McLeish	VP, Corporate Responsibility and Sustainability, Asia
Philippines	**Manila Water**	Karoline Sangalang	Finance and Governance Head
Philippines	**Manila Water**	Lawrence Velasco	Financial Planning Head
Philippines	**Rocky Mountain**	Pierre Yves Cote	CEO
Philippines	**Nestle**	Erenesto Mascenon	Head of Corporate Affairs
Philippines	**Nestle**	Ruth Novales	Corporate Affairs Dept.
Philippines	**Ayala Corporation**	Anna Maria M. Gonzales	Sustainability Manager
Cambodia	**AMRU Rice**	David Van	Business Advisor
Cambodia	**AMRU Rice**	Song Saran	CEO & President
Cambodia	**Khmer Organic**	Pang Sovannaroth	Assistant Manager
Cambodia	**Khmer Organic**	Thlang Sovann Pisey	Director
Cambodia	**GrandisTimber**	Nico Strydom	CEO
Vietnam	**Ecology Farming Corporation (Ecofarm)**	Nguyen Hong Quang	Chairman

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (3/6)

Investors

Country	Organisation	Name	Title
Indonesia	**UnoKapital**	Muhammad Maulana	Managing Partner
Philippines	**LGT Ventures**	Paolo Limcaoco	Investment Associate Southeast Asia
Cambodia	**Lotus Fund**	James Bui	Managing Director
Cambodia	**Incofin**	Dina Pons	
Vietnam	**SSI Asset Management Co Ltd**	Le Thi Le Hang	CEO
Vietnam	**Mekong Strategy Partners**	John McGinley	
Indonesia	**UnoKapital**	Muhammad Maulana	Managing Partner
Global	**Livelihoods Venture**	Guillaume Bouculat	Director of Development
Global	**Calvert Foundation**	Songbae Lee	Senior Investment Manager
Global	**Alterfin Fund**	Hugo Coudere	

Financial institutions

Country	Organisation	Name	Title
Philippines	**BDO**	Eunjoo Park-Minc	Chief Advisor- Sustainable Energy Finance Program
Philippines	**BPI**	Jo Ann	Sustainable Energy Finance
Vietnam	**Microfinance and Community Development Institute (MACDI)**	Dinh Thi Minh Thai	Director
Global	**Rabobank**	Elies Fongers	Project Manager, AgriBusiness Team

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (4/6)

Research institutions

Country	Organisation	Name	Title
Indonesia	**CIFOR**	Terry Sutherland	Team Leader & Principal Scientist
Indonesia	**CIFOR**	Pablo Pacheco	Researcher
Indonesia	**Wetlands**	Irwansyah Reza Lubis	Ecologist
Philippines	**World Agroforestry Centre**	Rodel Lasco	Philippines Co-ordinator
Vietnam	**World Agroforestry Centre (ICRAF)**	Delia C. Catacutan	Country Representative
Vietnam	**IRRI**	Dr Leocadio Sebastian	Regional Program Leader
Global	**CIFOR**	Steven Lawry	Research Director

Bilaterals/ DFIs

Country	Organisation	Name	Title
Indonesia	**GIZ**	Lisa Peterskovsky	Team Leader Agribusiness
Cambodia	**ADB**	Dang Thuy Trang	Environment Specialist
Cambodia	**ADB**	Jan Hensen	Senior Country Economist
Cambodia	**GIZ**	Cladius Bredehoft	National Project Co-ordinator
Indonesia	**GIZ**	Lisa Peterskovsky	Team Leader Agribusiness
Cambodia	**ADB**	Dang Thuy Trang	Environment Specialist
Vietnam	**IFC**	Lien Anh	Senior Operations Officer
Vietnam	**KFW**	Le Thuy Anh	Project Coordinator
Philippines	**IFC**	Donna Gonzales	Senior Investment Officer

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (5/6)

NGOs

Country	Organisation	Name	Title
Indonesia	**WWF**	Anwar Purwoto	Director Forest
Indonesia	**NTFP Exchange Programme**	Crissy Guerrero	Senior Advisor for Special Programs
Indonesia	**NRDC**	Yani Septiani	Project Coordinator
Indonesia	**NRDC**	Dr. Irsyal Yasman	
Indonesia	**Borneo Initiative**	Iwan K Permadi	Program Coordinator - Indonesia
Indonesia	**Borneo Initiative**	Wim Ellenbroek	Program Director
Indonesia	**Mercy Corp**	Andi Ikhwan	Program Director
Indonesia	**IDH**	Fitrian Ardiansyah	Indonesia Country Director
Philippines	**WWF Philippines**	Ria Lambino	VP for sustainable production
Philippines	**WWF Philippines**	Luz Teresa Baskinas	VP for Project Development
Philippines	**WWF Philippines**	Moncini Hinay	Project Manager
Philippines	**Philippine Tropical Forest Conservation Fund**	Atty. Jose Canivel	Executive Director
Philippines	**IFC**	Jesse Ang	Principal Investment Officer
Philippines	**Conservation International**	Enrique Nunez	Executive Director of Philippines
Philippines	**WWF Philippines**	Susan Roxas	

Annex 1: Stakeholder outreach

We engaged with selected sustainable landscapes experts across a broad range of value chain actors and stakeholders to identify opportunities across the four countries (6/6)

NGOs

Country	Organisation	Name	Title
Cambodia	**SNV**	Dr. Erik Van Waveren	Country Director
Cambodia	**FACT**	Youk Senglong	Deputy Executive Director
Cambodia	**FACT**	Om Savath	Executive Director
Cambodia	**Winrock**	Curtis Hundley	Chief of Party
Cambodia	**Winrock**	Joel Jurgens	Deputy Chief of Party
Cambodia	**Conservation International**	Tracy Farrell	Senior Technical Director
Cambodia	**Wildlife Alliance**	Thomas Gray	Global Development Director
Cambodia	**GERES**	Yann Fancois	Technical Advisor
Cambodia	**WCS**	Simon Mahood	Senior Technical Advisor
Cambodia	**WCS**	Ross Sinclair	Country Program Director
Cambodia	**IUCN**	Vanny Lou	National Co-ordinator
Vietnam	**SNV**	Richard McNally	Global Coordinator REDD+
Vietnam	**Rainforest Alliance**	Pham Tuong Vinh	Coordinator for Vietnam
Vietnam	**IDH**	Pham Thi Thanh Mai	Program Assistant
Vietnam	**Winrock**	Brian Bean	Co-Director
Global	**Rainforest Alliance**	Stephen Krecik	Senior Manager

Annex 2: Overview of Cambodia, Indonesia, Philippines and Vietnam INDCs

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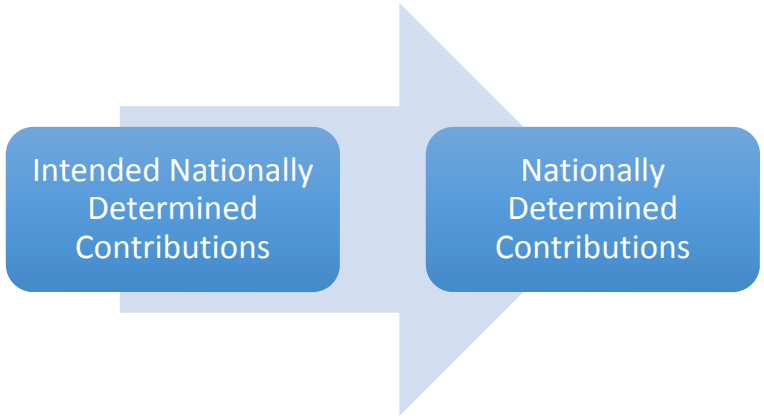
NDCs UPDATES: INDCs global overview and AFOLU

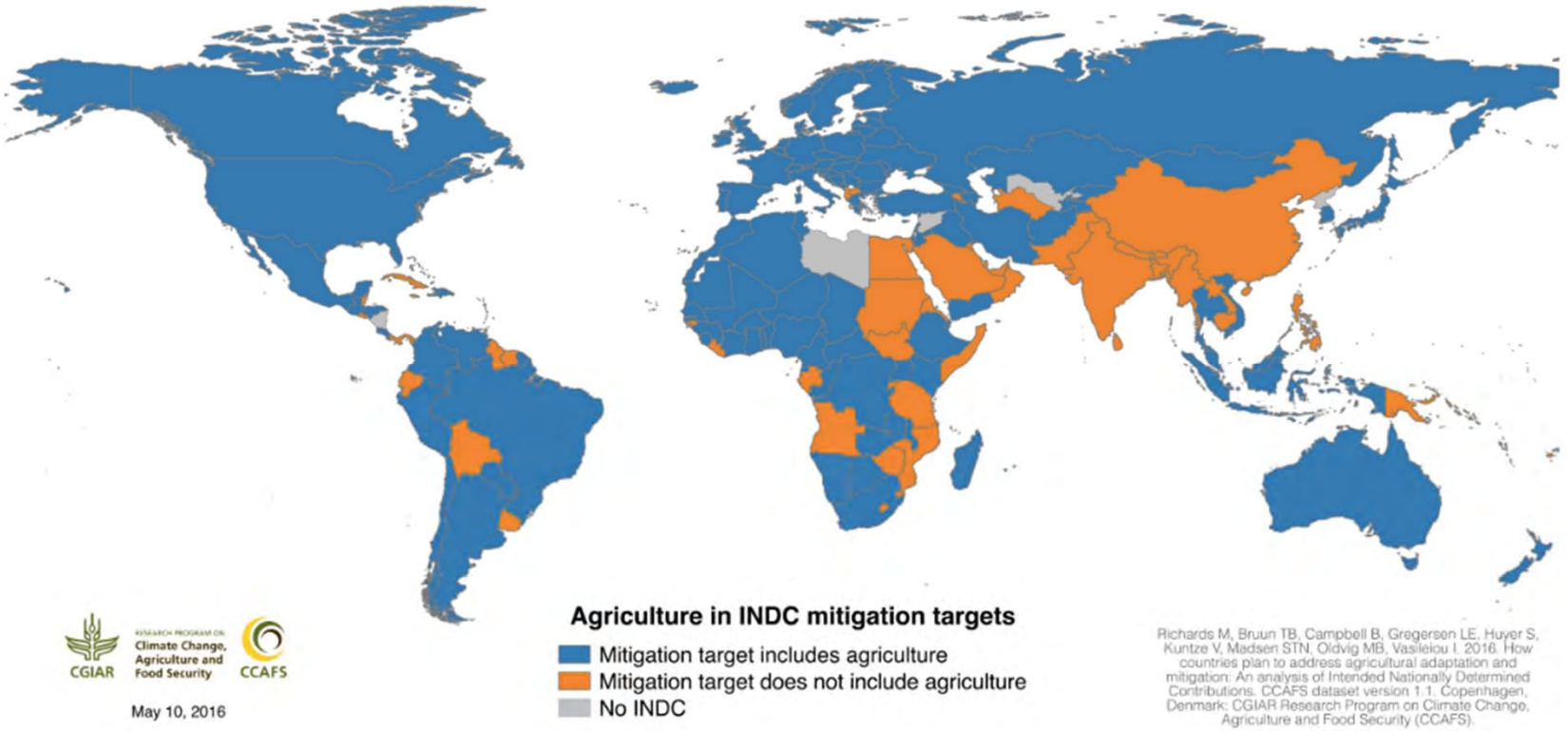


- The word 'intended' used for communicating proposed climate actions ahead of the Paris Agreement being finalized[1,2]
- As countries formally join the Paris Agreement and plan to implement these cliamte actions, the 'intended' is dropped and INDC is converted into a Nationally Determined Contribution (NDC)[2]
- The conversion happens when a country submits its respective instrument of ratification, accession, or approval to join the Paris Agreement[1,2]
- As of November 2016
  - 92 countries communicated their first NDCs to the UNFCCC[3]
  - Cambodia, Indonesia, Philippines, and Vietnam have not communicated their first NDCs[3]

- As of April 14, 2016, 161 INDCs submitted, covering 189 Parties to the convention, and 96% of global emissions[4]
- Implementation of INDCs will remain 9 $GtCO_2e$ higher in 2025 than the least cost 2°C scenario[5]
- Globally, AFOLU is often mentioned as sector with potential synergies between adaptation and mitigation actions and food security, included in over 70% of global INDCs[4]
- Most common AFOLU sub-sectors mentioned in INDCs mitigation[6]:
  - Agriculture: croplands (28%), fertilizer (23%) and agricultural residue (21%)
  - Example of mitigation strategies include nitrogen efficiency, alternate wetting and drying in paddy rice
  - Forestry: forest management (47%), deforestation (40%) and reforestation (40%)

SOURCE: (1) UNFCCC (2016) – Paris Agreement; (2) WRI (2016); (3) UNFCCC (2016) – NDC Interim Registry; (4) UNFCCC (2016) – Updated Synthesis Report of INDCs; (5) USAID RALI (2016); (6) Richards et al. (2016)

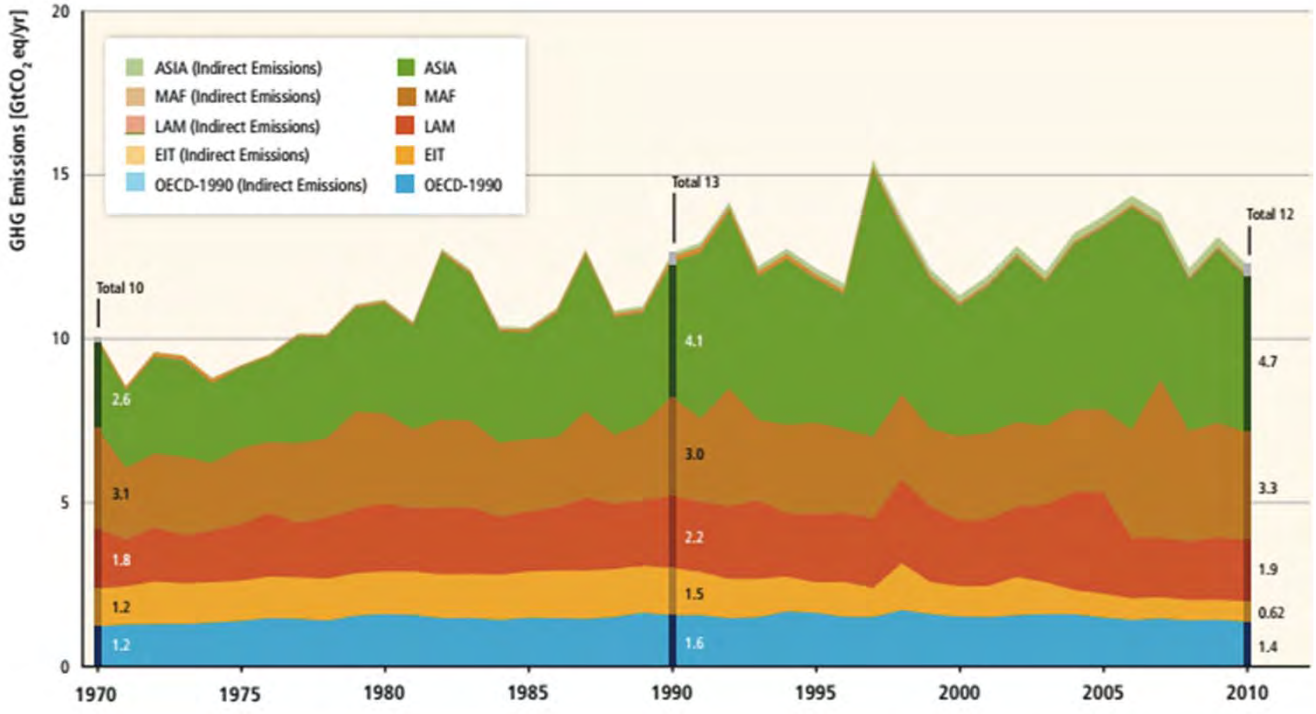
Over 60% of INDCs included mitigation targets for agriculture and almost 70% included agriculture as adaptation priorities



SOURCE: Richards et al. (2016)

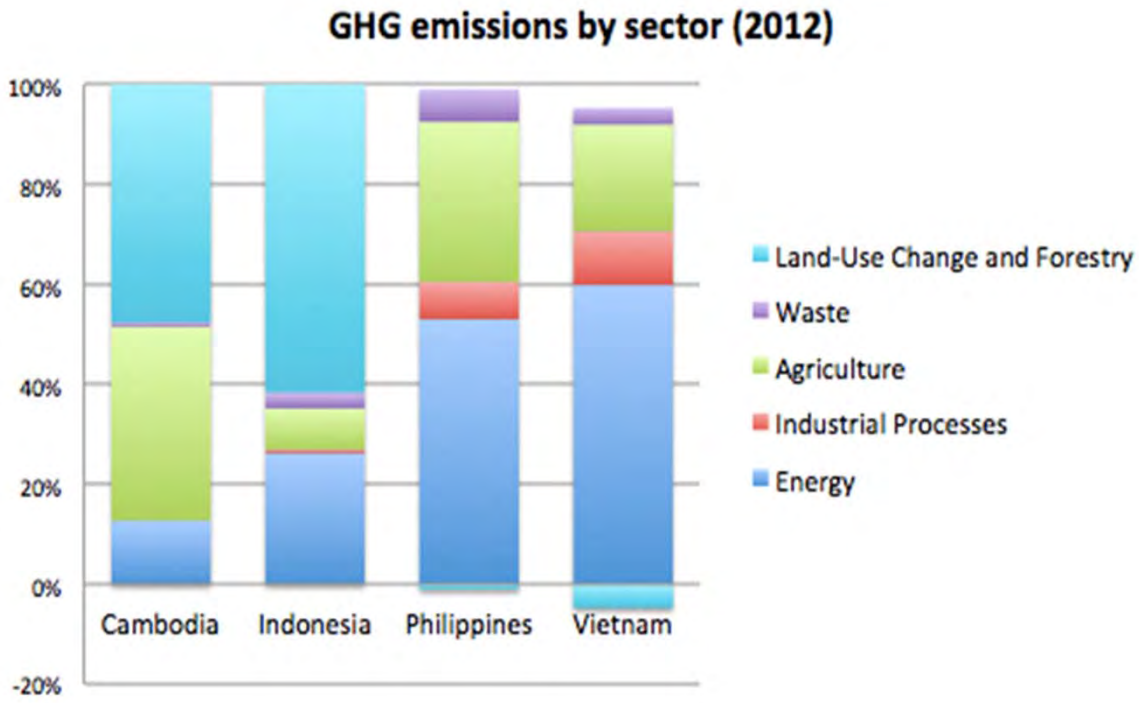
AFOLU EMISSIONS: Asia

Asia accounts for the largest proportion of global AFOLU emissions during 1990-2010, and also the highest potential for cost-effecitve emission reductions in the AFOLU sector



SOURCE: (1) Smith et al. (2014) – IPCC 5th Assessment Report Chapter 11

AFOLU EMISSIONS: Cambodia, Indonesia, Philippines and Vietnam



Source: WRI (2016)

- Agriculture's contribution to national emissions ranges from 8% in Indonesia to almost 40% in Cambodia in 2012[1]
- LULUCF sector is a net sink for Philippines and Vietnam, is a net source for Indonesia (62%) and Cambodia (47%) in 2012[1]
- Sub-sector emissions shows that rice cultivation accounted for the largest proportion of agricultural sector emissions in Cambodia (~ 70% in 2000) Indonesia (~ 50% in 2000), Philippines (44% in 2000)[2] and Vietnam (~ 45% in 2010)

SOURCE: (1) WRI (2016); (2) Second national communications of Cambodia, Indonesia, Philippines and Vietna; (3) INDC of Vietnam

AFOLU MITIGATION IN INDCs: Cambodia, Indonesia, Philippines and Vietnam

- *Forestry is included in all INDCs as mitigation measure some with targets (Cambodia and Vietnam)*
- *Only Indonesia and Vietnam included sustainable agriculture as part of mitigation*

Country	INDC economy-wide target		AFOLU mitigation targets/measures in INDC	
	Unconditional	Conditional	Agriculture	Forest and other land use
Cambodia	27% below BAU in 2030	Sequestration from LULUCF 4.7 tCO2e/ha/yr	No Included in adaptation	Yes 60% forest cover by 2030 (conditional action)
Indonesia	29% below BAU by 2030	41% below BAU by 2030	Yes Improved agricultural productivity	Yes • Reducing deforestation and forest degradation • Restoring ecosystems
Philippines	N/A	70% below BAU by 2030	No Included in adaptation	Yes LULUCF is included
Vietnam	8% below BAU by 2030	25% below 2030 BAU	Yes Sustainable agriculture practices	Yes • 45% forest cover by 2030 (unconditional action) • REDD, SFM, PFES

SOURCE: (1) Zeleke et al. (2015) – AFOLU working group; (2) UNFCCC Submission Portal (October 14, 2016) for INDCs of Cambodia, Indonesia, Philippines and Vietnam; (3) Richards et al. (2016)

AFOLU MITIGATION IN INDCs: Cambodia, Indonesia, Philippines and Vietnam

- *Agriculture sub-sector mitigation actions were mentioned extensively by Vietnam, e.g. crop management, shift in urea use as fertilizer, agricultural residue use as fertilizer, AWD in rice*
- *Forestry sub-sector mitigation actions were cited by Cambodia, Indonesia and Vietnam, primarily involving forest management, deforestation prevention, and afforestation*

COUNTRY	MITIGATION												
	Agriculture							Forestry					
	Croplands	Fertilizer	Ag. residue	Rice	Soil carbon	Agroforestry	CSA	Forest management	Deforestation	Afforestation	Reforestation	Peatland	Coastal zone
Cambodia	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗
Indonesia	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗
Philippines	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Vietnam	✓	✗	✓	✓	✗	✗	✗	✓	✓	✓	✓	✗	✓

SOURCE: Richards et al. (2016) and UNFCCC Submission Portal (October 14, 2016) for INDCs of Cambodia, Indonesia, Philippines and Vietnam

AFOLU ADAPTATION IN INDCs: Cambodia, Indonesia, Philippines and Vietnam

- *Cambodia, Indonesia and Vietnam commonly mentioned agriculture adaptation actions, such as measures to ensure sustainability of fishery and aquaculture resources, climate smart agriculture, and climate resilient crop varieties*
- *Only Vietnam mentioned the use of financial mechanism, e.g. strengthening an insurance system to share climate risks*

COUNTRY	ADAPTATION													
	Financial mechanism	Early warning system	Water management	Irrigation	Diversification	Crops	Soil	Agroforestry	Knowledge transfer	CSA	Livestock	Indigenous knowledge	Agroecology	Fishery and aquaculture
Cambodia	✗	✓	✓	✗	✗	✓	✗	✗	✗	✓	✗	✗	✓	✓
Indonesia	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓
Philippines	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Vietnam	✓	✗	✗	✗	✗	✓	✗	✗	✓	✓	✓	✗	✗	✓

SOURCE: Richards et al. (2016) and UNFCCC Submission Portal (October 14, 2016) for INDCs of Cambodia, Indonesia, Philippines and Vietnam

AFOLU FINANCE IN INDCs: Cambodia, Indonesia, Philippines and Vietnam

- Cambodia and Vietnam specified financial aid request
- None makes note of the potential contribution to private companies that made commitment in recent years to reduce emissions in AFOLU sector
- Where the role of private sector is mentioned in INDCs, no concrete measures to leverage its potential are given

COUNTRY	FINANCE
Cambodia	1.27 billion USD for implementing INDC activities
Indonesia	Amount not specified, but mentioned 5.92 billion USD need to reach 41% emission reduction in the previous INDC draft
Philippines	• Amount not specified • Mentioned the need for private sector involvement

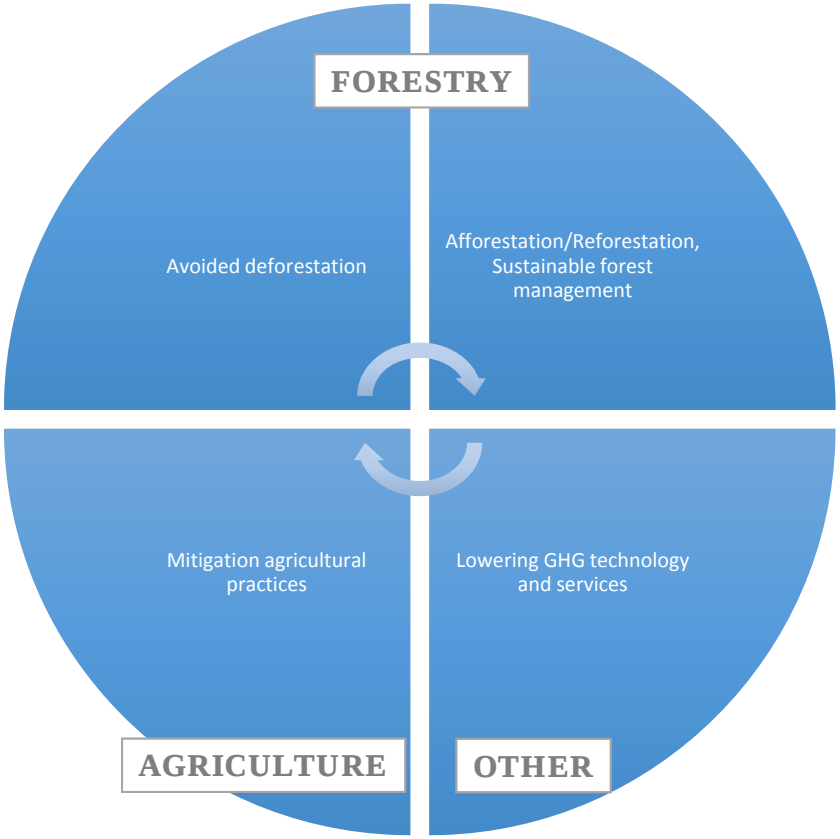
Vietnam	• Amount not specified in INDC submitted (but in Technical Report for INDC)
	  • ~12 billion USD needed from international support for agriculture
	  • ~1 billion USD needed for LULUCF
	• Mentioned the need for private sector involvement in sustainable forest management and A/R

SOURCE: UNFCCC Submission Portal (October 14, 2016) for INDCs of Cambodia, Indonesia, Philippines and Vietnam, Vietnam INDC Technical Report (2015), and CIFOR (2016) – *Glaring gap: Countries are overlooking how the private sector can help meet national climate goals*

Annex 3: Emission reduction and co-benefits framework of assessment

Note: For list of mitigation activities, calculation for emission reduction potential and associated assumptions, and co-benefits for each business case is embedded in specific knowledge brief

MITIGATION CATEGORIES AND ACTIVITIES



Credit: Icons designed by Freepik

MITIGATION CATEGORIES AND ACTIVITIES: MITIGATION AGRICULTURAL PRACTICES

ACTIVITY	EXAMPLE	MITIGATION POTENTIAL		
		CO_2	CH_4	N_2O
Agronomy	Improved crop varieties, extending crop rotation with legume crop, use of temporary vegetative crop cover	+		+/-
Nutrient management	Optimal and efficient use of synthetic fertilizer, manure, biosolids (type, timing, nutrient ratio, rate of application)	+		+
Tillage/residue management	• Zero-tillage, conservation tillage • Crop residue as biochar for incorporating into soil • Anaerobic digestion of ag. waste (biogas) • Crop residue as compost	+ +	 + +	+/- +/- +/-
Rice management	One time or multiple drainage, avoidance of water logging during dry season, optimal timing of organic residue addition, rice residue management	+/-	+	+/-

\+ Means positive mitigation impact

SOURCE: Adapted from Smith et al.(2007), Uprety et al. (2012) and Smith et al. (2014)

MITIGATION CATEGORIES AND ACTIVITIES: MITIGATION AGRICULTURAL PRACTICES

ACTIVITY	EXAMPLE	MITIGATION POTENTIAL		
		CO_2	CH_4	N_2O
Agroforestry	Inter-cropping/mixing of trees, crops and/or pasture, e.g. coffee or cacao with rubber	+		+/-
Set-aside, LUC	Replanting to native grassess and trees	+		+
Biochar application	Application of biochar into soil as soil amendment	+		+
Management of organic soils	Avoid or reduced drainage of wetlands	+	-	+/-
Restoration of degraded lands	Erosion control, organic amendments, nutrient amendment	+		+/-

+ Means positive mitigation impact

SOURCE: Adapted from Smith et al.(2007), Uprety et al. (2012) and Smith et al. (2014)

MITIGATION CATEGORIES AND ACTIVITIES: FORESTRY

ACTIVITY	EXAMPLE	MITIGATION POTENTIAL		
		CO_2	CH_4	N_2O
AVOIDED/REDUCED DEFORESTATION				
Reduced emissions from deforestation	Reducing deforestation, SAB agriculture, and forest fire, and protection of peatland forest	+	+	+
AFFORESTATION/REFORESTATION AND SUSTAINABLE FOREST MANAGEMENT				
Afforestation, reforestation	Planting trees in non-forested agricultural land	+		
Forest restoration	Protecting secondary forests and other degraded forests, and allowing them to sequester carbon	+	+	+
Forest management	• Management of forests for sustainable timber production • Forest regeneration, reduced degradation	+	+	+

+ Means positive mitigation impact

SOURCE: Smith et al. (2014) – contribution to IPCC 5th Assessment Report

EMISSION REDUCTION ESTIMATES BY ACTIVITY: MITIGATION AGRICULTURAL PRACTICES

ACTIVITY	All GHG (tCO2e/ha/year)		
	Mean estimates	Low	High
Agronomy	0.98	0.51	1.45
Nutrient management	0.62	0.02	1.42
Tillage and residue management	0.72	-0.44	1.89
Agro-forestry	0.72	-0.44	1.89
Set-aside and LUC	5.36	1.17	9.51
Organic soils restoration	70.8	7.33	124.31
Degraded lands restoration	3.45	-0.37	7.26

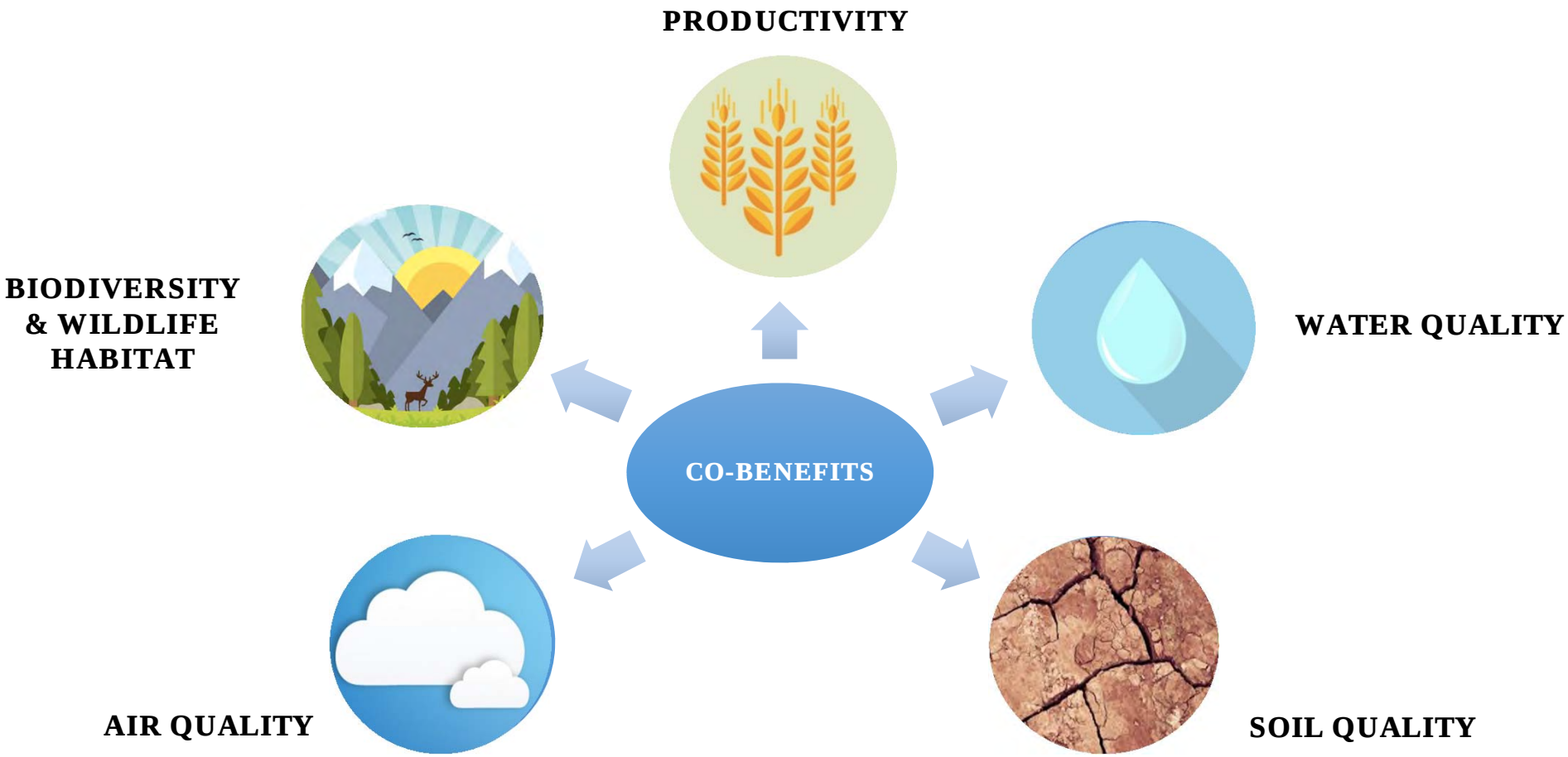
SOURCE: Smith et al. (2007) - IPCC 4th Assessment Report, Chapter 8, Table 8.4 for warm moist climate zone

EMISSION REDUCTION ESTIMATES BY ACTIVITY: FORESTRY

ACTIVITY	SCOPE	ALL GHG ($tCO2_e$/ha/yr)	SOURCE
Avoided deforestation (Tropical rain forest to degraded land)	Tropical rain forest	42.7	FAO (2013)[1]
A/R: Forest plantation (Degraded land to tropical rain plantation)	Tropical rain forest	1.7-3.8	FAO (2013)
A/R: Annual crops cultivation (Degraded land to annual crops)	Tropical rain forest	1.2	FAO (2013)
Forest management	Non-Annex I	1.14	IPCC (2000)

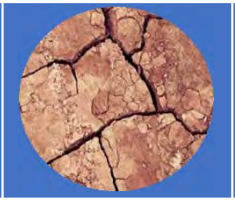
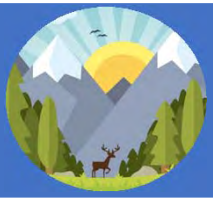
SOURCE: (1) FAO (2013) - EX-ACT Tool User-friendly Manual, page 15 Figure 4; (2) IPCC (2000) – IPCC Special Report Executive Summary

CO-BENEFIT ASSESSMENT CRITERIA



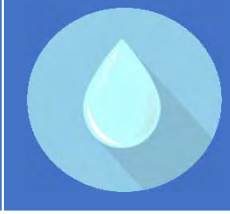
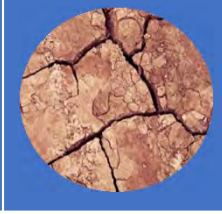
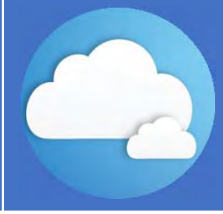
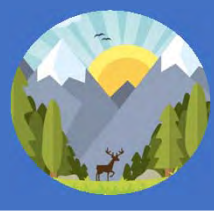
SOURCE: Adapted from Smith et al. (2007) – IPCC 4th Assessment Report
Credit: Icons designed by Freepik

CO-BENEFIT ASSESSMENT CRITERIA: MITIGATION AGRICULTURAL PRACTICES

ACTIVITY					
Agronomy	+	+/-	+	+/-	+/-
Nutrient & fertilizer management	+/-	+	+	+	
Tillage/residue management	+	+/-	+		+
Rice management	+	+		+/-	
Agroforestry	+/-	+/-			+
Set-aside and LUC	-	+	+	+	+
Restoration of degraded land	+	+	+		+
Organic (wetland) restoration	-		+		+

SOURCE: Smith et al. (2007) - IPCC 4th Assessment Report

CO-BENEFIT ASSESSMENT CRITERIA: FORESTRY

ACTIVITY				
AVOIDED DEFORESTATION				
Reducing deforestation	+	+		+
A/R AND SFM				
Afforestation,reforestation	+/-	+		+/-
SFM in plantations	+	+		+
SFM in native forest	+	+		

SOURCE: Smith et al. (2007) - IPCC 4th Assessment Report

Annex 4: Glossary

Annex 5: Glossary of financial terms

Term	Definition
Capital expenditures	Funds used by a company to acquire or upgrade physical assets such as property, buildings or equipment
Concessionality	Measure of the "softness" of credit (below market financing) reflecting the benefit to the borrower compared to a loan at market rate
De-risking/ guarantees	Guarantee from a lending institution/donor agency ensuring the liabilities of a debtor will be met even if the debtor fails to settle a debt
Equity	Ownership interest in the business
Exit opportunities	Contingency plan that is executed by an investor to liquidate a position in a financial asset or business once certain predetermined criteria has been met or exceeded
Impact investments	Type of investing that aims to generate specific beneficial social or environmental effects in addition to financial gain
Incubation	Business models that are still in the nascent stage lacking a full-fledged business plan
Liquidity	Availability of liquid assets to a market or company; liquid assets refer to cash or assets that can be readily converted to cash
Long-term debt	Loans and financial obligations with maturities greater than one year
Mainstream	Proven business models that are adopted by a large number of companies
Scaling	Businesses that are have already piloted and are in the process of scaling up
Technical assistance	Support provided to businesses in terms of content, business, technology expertise
Venture capital	Type of private equity; a form of financing that is provided by early stage firms that are deemed to have high growth potential

Annex 5: Glossary of sustainable landscape terms

Term	Definition	Reference
Afforestation	Process of establishing and growing forests on bare or cultivated land, which has not been forested in recent history	FAO (2013) – EX-ACT project applications
Deforestation	Decline of canopy cover to below 10%, conversion of forest to non-forest	IPCC (2000) – Special report on LULUCF
Emissions	The release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time	IPCC (2006) – IPCC 2006 Guidelines for National GHG Inventories
Greenhouse gases	Direct GHGs include six gases considered as main responsible for climate change as specified under the Kyoto protocol: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride. Indirect GHGs include SO_2, NO_x, CO and NMVOC	UNFCCC (2013) – GHG data from UNFCCC
Payment for ecosystem services	An economic instrument designed to provide positive incentives to users of agricultural land and those involved in coastal or marine management. These incentives are expected to result in continued or improved provision of ecosystem services, which, in turn, will benefit society as a whole	FAO (2013) – EX-ACT project applications
Reforestation	Replanting of forests on lands that have previously contained forests but that have been converted to some other use	UNFCCC – Glossary of climate change acronyms
Removals	Removal of GHG and/or their precursors from the atmosphere by a sink	IPCC (2006) – IPCC 2006 Guidelines for National GHG Inventories
Sustainable landscape	Landscape in which management of forests, agricultural areas, and other inter-connected ecosystems reduces GHG emissions, enhances carbon storage, and provides other benefits for human well being	USAID (2016) – climate change strategy
Soil organic matter	Material produced originally by living organisms that is returned to the soil and goes through the decomposition process	FAO (2013) – EX-ACT project applications
Watershed	Topographically delineated area that is drained by a stream system, i.e. the total area that drains to some point on a stream or river	FAO (2013) – EX-ACT project applications

Knowledge brief #1

Sustainable agricultural production to secure procurement and access key export markets

Sustainable tea production by Unilever in Vietnam

USAID FROM THE AMERICAN PEOPLE

Dalberg

Case study: Sustainable tea production by Unilever in Vietnam: Table of contents

Case study: Sustainable tea production by Unilever in Vietnam: Description

Unilever, in partnership with IDH and Rainforest Alliance was running a programme to procure sustainably grown certified tea from smallholder tea farmers in Vietnam

Smallholder farmers want to enhance yield and increase income by growing certified tea for supply to Unilever

- **Potential solution:** farmers can increase yields and earn long term price premiums by growing certified tea for supply to Unilever; and strengthen capacity to access key export markets for tea through Unilever's network
- **Challenge:** growing certified tea involves certain challenges and costs for smallholders such as:
  - *Application of improved agricultural practices*. farmers need considerable training support to follow Rainforest Alliance (RA) certification standards, and may need to make new investments in their tea plantations
  - *Assured off-taker/ market*: smallholder farmers face the risk of not getting assured returns in the absence of advance purchase agreements from Unilever
  - *Lack of awareness*: farmers may not understand the benefits of sustainable tea growing or certification

Unilever wants to secure long term supply of certified tea to meet global commitments to procure 100% sustainably produced tea by 2020

- **Potential solution:** Unilever want to comply with its global commitments to source 100% of agriculture raw material sustainably by 2020, and reinforce its brand reputation as a leading supplier of certified tea in the global market[1]
- **Challenge:** Unilever faces certain challenges in this project, related to:
  - *Lack of funding*: insufficient funding to fully fund the programme, given tension between Unilever's purchasing department budget (driven by short term considerations to source tea from cheaper markets internationally) and CSR/ sustainability department (guided by long term considerations to secure long-term supply)[2]
  - *Technical support:* lack of awareness among farmers on sustainable tea growing
  - *High costs of farmer training:* considerable investment to train farmers to follow certification standards

[1]: We understand from stakeholders consultations that Rainforest Alliance and IDH were a part of the programme for the first 2-3 years (i.e. 2013-15). Unilever and IDH are now running Phase II of the programme

[2] This programme was funded from Unilever's CSR budget

Case study: Sustainable tea production by Unilever in Vietnam: Assessment

The programme promotes better management of tea farms through application of sustainable agriculture standards; and has the potential to be become profitable within 2-3 years of operation

Criteria	Assessment	Scoring[1]

Impact Potential	- **Potential for high GHG emissions reduction** through application of Good Agricultural Practices (GAP) and sustainable agriculture standards.. **Estimated reduction of c.700k tCO2e/year;** Target was to reach **20k tea farmers to produce 30k tons of tea over 2013-15. Other benefits:**
	  - *Improved productivity/ yield* through agronomic practices (e.g. crop rotation, crop cover); **Estimated 35% increase in farmer yields** within 1-3 years[2]
	  - *Improved soil quality*: soil conservation practices improve soil fertility through erosion control, soil cover, etc.
	  - *Improved water quality* through wastewater treatment, agrichemicals run-off control (e.g. vegetative barriers); prevention of sedimentation of water bodies
	  - *Biodiversity*: protection of natural eco-systems and endangered species
	- **Significant co-benefits for farmers:** (i) strengthened capacity to access mainstream export markets; (ii) improved living conditions by way of compliance with socio-economic indicators related to working conditions (iii) potential for average farmer income to increase **by 10-15%**[3]
		●

Economic effectiveness	- **High potential for increased market share,** given growing demand for sustainably grown tea in the global market - **Participation of Unilever** as assured off-taker improves commercial feasibility of the project. Stakeholder consultations suggest that the model can start generating profits within 2-3 years of operation - However, **costs of high costs of farmer training and capacity development to follow certification standards** (e.g. US$800k to train 20k farmers over 3 years) - **High potential to reach commercial feasibility within 2-3 years** (e.g. through reduction in training costs for farmers over the years; potential to gain increased market share through sale of certified tea)	◔

[1] Our scoring of the assessment criteria is based on Dalberg analysis; stakeholder consultations during the field visits; and input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016
[2] Harvard Business Review (2011), "Sustainable Tea at Unilever"
[3] IDH Cost-Benefit Analysis of Farmer Field Schools and Certification for Smallholder Tea Farmers in Kenya

Case study: Sustainable tea production by Unilever in Vietnam: Assessment

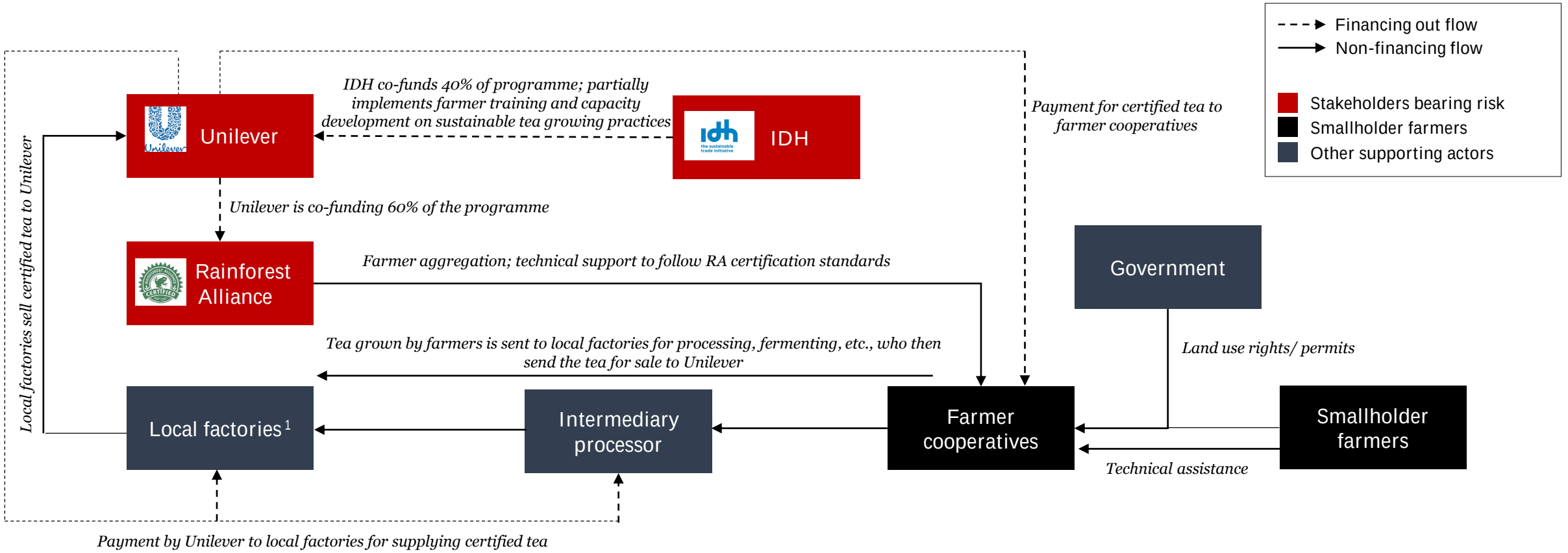
The programme has high potential for scalability, and can be replicated across geographies and sectors for commodities with a growing market demand

Criteria	Assessment	Scoring[1]
Innovation and scalability	- **Mature and mainstream model** used by large MNCs to secure sustainable supply of commodities (e.g. Nestle to secure sustainable supply of coffee/cocoa in Indonesia) with good track record by multiple stakeholders (including NGOs, etc.) in implementing sustainable agricultural practices to secure sustainable commodity supply - **High potential for scalability and replication:** high potential for scalability since it aligns incentives of all stakeholders along the supply chain. Project can be replicated across other geographies and for commodities with a growing demand in the international market	
Other assessment factors	- **Effective partnership between Unilever, Rainforest Alliance and IDH** ensures improved credibility for the project. The three partners have implemented a similar successfully programme in Kenya in the past - **Partnership with the Vietnam Tea Initiative and the Ministry of Agriculture and Rural Development (MARD)** ensures government support to deal with legal/governance issues of land rights/ permits	

[1] Our scoring of the assessment criteria is based on Dalberg analysis; stakeholder consultations during the field visits; and input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016

Case study: Sustainable tea production by Unilever in Vietnam: Financial and non financial flows

The programme effectively links Unilever with Vietnamese tea farmers through a market based mechanism to secure sustainably grown certified tea to meet its global commitments



1: These are privately owned tea factories, who can either supply to Unilever or other buyers

Case study: Sustainable tea production by Unilever in Vietnam: Stakeholder drivers and challenges

The programme enables Unilever to meet its global market commitments to source 100% of agricultural raw materials sustainably by 2020

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Unilever	**Financing activities** - Co-funds 60% of programme **Connect to markets** - Connects smallholder tea farmers with mainstream export markets	– **Compliance with global commitments:** Unilever can comply with its global sustainability targets/ commitments to source 100% agriculture raw material for tea by 2020, by following RA certification standards – **Meet growing demand:** Unilever can meet demand for sustainably grown tea in the international market through complying with certification standards	– **Lack of funds**: tension between purchasing department and CSR/sustainability department limits funds to fully fund the programme – **Assured commodity supply**: farmers and local tea factories may sell certified tea to other buyers for a higher prices, in the absence of a contract with Unilever – **Farmer awareness**: lack of awareness among smallholders on economic benefits sustainable tea growing practices – **Technical support**: Unilever may not have technical expertise and skills to train farmers to comply with certification standards	– Potential to get de-risking capital or grant funding from donor to support high costs of farmer capacity development, given limited CSR budget – Sign contract farming agreement/MoU with tea farmers and local tea factories for assured tea supply – Build trust and awareness among local communities on benefits of following sustainable tea growing practices and following RA certification standards – Provide results based financing for input grants to farmers to accelerate quality assurance

Case study: Sustainable tea production by Unilever in Vietnam: Stakeholder drivers and challenges

Rainforest Alliance and IDH can mainstream certification of tea in Vietnam and get strengthened access to export markets through Unilever supplier network

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
	Capacity building - Implements farmer training to follow sustainable tea growing practices; monitor farmer compliance to RA certification standards	– **Large scale impact**: opportunity to create impact on a larger scale by partnering with Unilever – **Promote large scale certification**: opportunity to mainstream certification of tea in Vietnam – **Access to markets**: strengthened access to export markets through Unilever supplier network	– **Lack of farmer awareness**: requires considerable technical support to create awareness among farmers on benefits of changing agricultural practices and pursuing RA certification	– Ensure legal MoU with Unilever for training and capacity building programme to ensure programme sustainability in the long term – Upscaling technical assistance through lead farmer trainings and/or farmer field schools to minimise training costs over the years
	Financing activities - Co-funds 40% of programme **Capacity building** - Farmer training on tea certification and sustainable tea growing	– **Large scale impact:** IDH has a mandate to create long term economic, environmental and social sustainability impact on Vietnamese tea smallholders	– **Lack of funds**: lack of sufficient funding to fully fund programme – **High capacity building costs**: high costs of technical support to farmers to comply with tea certification standards/practices	– Potential to get de-risking capital from donors to share technical assistance cost of farmer training and capacity building – Build trust/awareness among local communities on benefits of sustainable tea growing/ certification

Case study: Sustainable tea production by Unilever in Vietnam: Stakeholder drivers and challenges

Local tea factories benefit from getting secured business through Unilever's supply network, and can earn price premiums through factory certification

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Local tea factories***	**Connect to markets** - Responsible for factory certification and tea processing for sale to Unilever/ other buyers	– **Secured business:** privately owned local factories invest in factory certification to get assured business through Unilever's supply network – **Potential to earn price premiums:** local factories can earn high prices by selling certified tea to large player like Unilever – **Cost-sharing:** potential to share costs of farmer training on certification with IDH and Unilever (which local factories may have to incur on their own, in the absence of this programme)	– **High cost of tea certification:** high cost of certifying tea factories; setting up internal control and monitoring systems to monitor certification compliance in factories. (c.US$400k/ year/ factory as one-time certification cost; and c.US$100k/year/ factory as recurrent factory certification costs) [1] – **Assured market:** risk that Unilever may not buy all the certified tea produced by local factories	– Enter into MoU with Unilever to get secured business – Potential to get donor funding to support high certification costs through Unilever's network

[1]: IDH Cost-Benefit Analysis of Farmer Field Schools and Certification for Smallholder Tea Farmers in Kenya

Case study: Sustainable tea production by Unilever in Vietnam: Stakeholder drivers and challenges

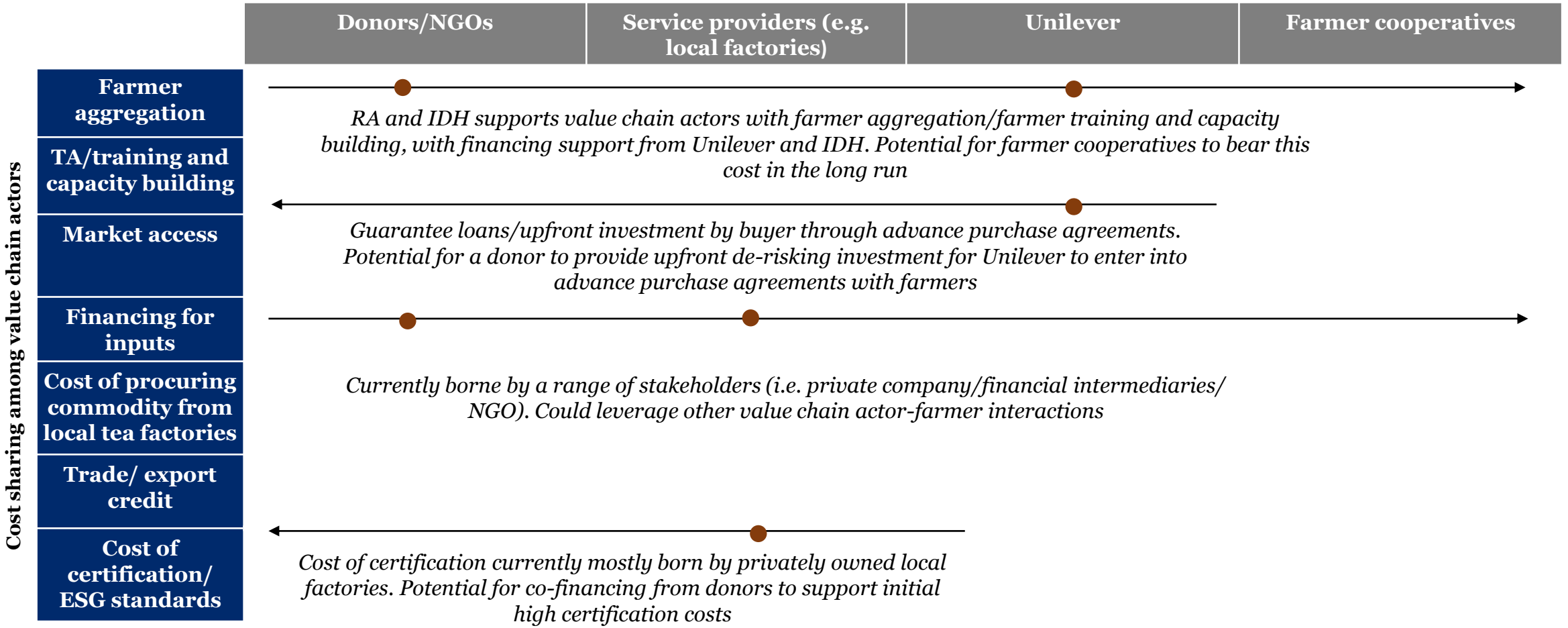
Smallholder tea farmers can increased incomes through increased yields and price premiums for growing certified tea; and access mainstream tea export markets through Unilever's network

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 *Smallholder tea farmers*	**Capacity building** - Tea production through application of sustainable agriculture practices and RA certification standards	– **Improved income: estimated 35% increase in farmer yields** provides farmers with positive returns on investment within 1-3 years[1] – **Access to markets:** improved capacity to access mainstream tea export markets through Unilever's network – **Improved living conditions.** RA certification requires compliance with socio-economic indicators related to working conditions and community relations – **Improved capacity:** training in RA certification improves farmer awareness and technical skills/expertise on sustainable agriculture practices	– **Assured off-taker/market**: farmers may not get assured returns for growing certified tea without advance purchase agreements – **Technical support**: requires considerable training to comply with RA certification standards; may face challenges if new investments are required in their tea plantations to comply with RA standards	– Develop technical skills and capacity on sustainable tea growing practices through close engagement in NGO training programme – Sign advance purchase agreement with off-taker to get assured returns

[1]: IDH Cost-Benefit Analysis of Farmer Field Schools and Certification for Smallholder Tea Farmers in Kenya

Sustainable agricultural production to secure procurement and access key export markets: Cost sharing burden

While initial donor funding is required to share these costs, the cost bearing responsibility should eventually move to the private sector to be financially self-sustainable in the long term



Change in cost bearing responsibility

Current burden of cost

Case study: Sustainable tea production by Unilever in Vietnam: Potential support

We came up with three potential options through which donors and multilaterals could catalyse private sector investments in this programme

Funds for capacity building and technical assistance

- Estimates from similar programmes (e.g. Unilever's tea certification programme with RA in Kenya) suggests that training cost per farmer per 12 month cycle is around US$40 [1]
- Training 20k farmers will require an investment of US$800k over 2-3 years), although considerable potential for these costs to reduce over the years

✓ Training and capacity building costs are shared by Unilever, IDH and Rainforest Alliance

✓ Potential to get additional funding to support these costs, given Unilever has limited budget to fully fund the program from its CSR/sustainability budget

Initial de-risking capital for tea certification costs

- High costs of tea certification amounting to ~US$ 500k/year (comprising cost of one time factory certification c.US$ 400k; and recurrent cost of certification of factory of US$ 100k/ year) [2]

✓ Large part of certification costs currently borne by privately owned local tea factories

✓ Potential for initial de-risking capital from donors to support initial high cost of one time certification of tea factories (although not directly related to supporting Unilever's costs of the programme) [3]

Grant funding to enter into AMC with farmers

- Unilever faces a risk of farmers selling certified tea to other middlemen/ buyers for higher prices

✓ Potential for donors to provide grant funding for Unilever to enter into advance purchase agreements to get guaranteed supply of tea

✓ Farmers can use these contracts as collateral for bank loans to purchase farm inputs

[1] IDH Cost Benefit Analysis of Farmer Field Schools and Certification for Smallholder Tea Farmers in Kenya
[2] Based on estimates of Unilever's tea program in Kenya
[3] Assuming donors finance 50% of one time certification cost of 30 tea factories, i.e. US$6M

Case study: Sustainable tea production by Unilever in Vietnam: Potential support

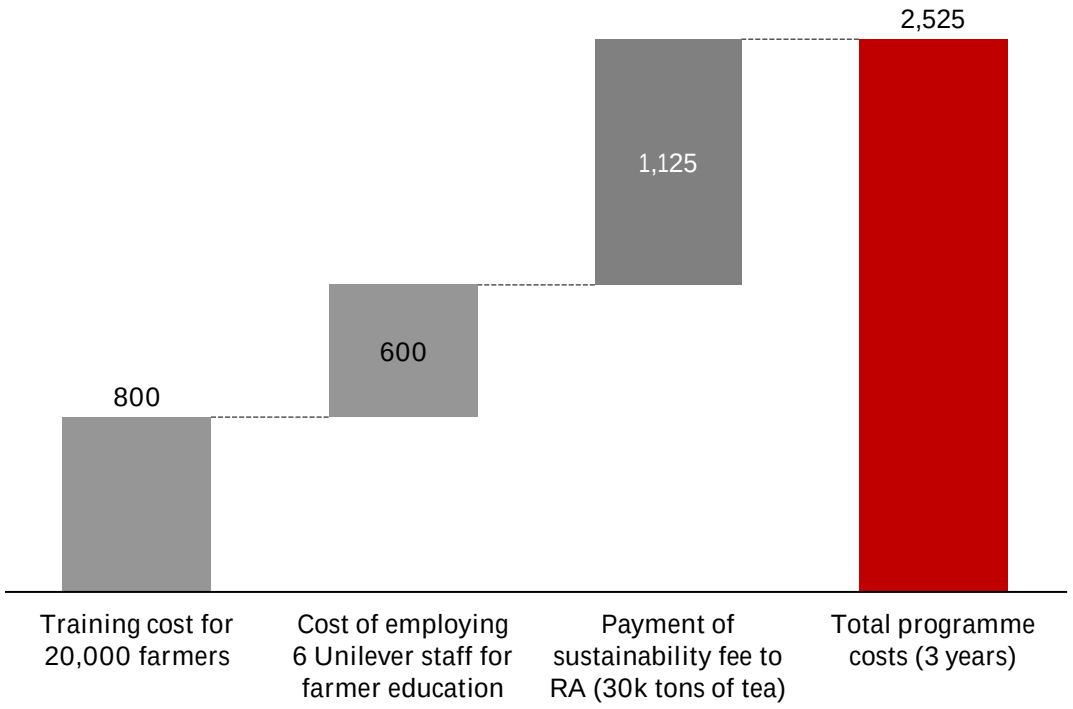
....however following the workshop group discussion, these options were refined to fit into four large buckets of donors/multilateral support to catalyse private investments in the programme

	Potential role for donors/ multilaterals
Capacity building and technical assistance	- **Institutional capacity building support** for business development service providers; financial institutions; farmer training and capacity development, other government and regulatory stakeholders (e.g., helping business enterprises to create business plans to operationalise these models to achieve their commitments; support implementing NGO with capacity building grant to develop farmer skills and to meet ESG and certification requirements)
Financial interventions	- **Initial de-risking capital** or loan guarantees to support incubation of similar projects (e.g., supporting high initial costs of the certification process; high transaction costs of farmers training, entering into advance purchase agreement with farmers for commodity supply, etc.) - This will help support prototyping and demonstration of effective enterprises that can achieve climate change goals and generate commercial returns at the same time
Convening platform	- **Set up a platform** to facilitate stakeholder collaboration and discussion on similar models to create greater market incentives for stakeholders to invest in securing green and sustainable supply chains - **Connect smallholder farmers with off-takers** to strengthen incentives for smallholders to participate in the project and get assured returns
Impact monitoring and evaluation	- **Support** M&E and impact assessment of the model (e.g., impact on emissions reduction, farmer incomes, market share for Unilever) to generate learnings for project scalability and replication

[1] Options for potential support have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016

The model has potential to generate profits within 2-3 years, through increased sales and market share of sustainably grown tea

Estimated costs of Unilever's sustainable tea growing programme (over 3 years)[1]
US$ 'ooos



Although costs for Unilever's sustainable tea growing programme are high, with lack of proven revenues…

- *Total costs are reasonably high:* It costs c.US$2.5M to train and certify 20k smallholder farmers; employing consultants for baseline studies; monitoring farmer compliance, etc.
- *No data on revenues to justify investment by core business units:* Currently there is insufficient revenues data to prove commercial feasibility of programme and justify funding from the core business units; programme is funded by the CSR unit of Unilever in Vietnam

…Unilever and its partners expect commercial sustainability within 2-3 years

- *Potential for increased market share and revenues*: securing sustainable supply can boost brand equity – and potentially market share – as customers increasingly demand/expect sustainable produce and align it with Unilever's brand. Certification is not used to charge a premium for sustainable tea
- *Reduced programme costs:* training costs for RA certification and farmer education are likely to decline over the years with improved farmer awareness
- *Proven track record:* similar programmes in Kenya for training and certification of 560k smallholders towards sustainable agricultural practices has been successful

[1] Costs related to tea certification are based on costs from a similar Unilever tea programme in Kenya. These have been computed for training 20k farmers to grow 30k tons of tea in 30 factories in Vietnam. Farmer compliance costs covers the most significant part of the one-time and recurrent cost of RA certification. Costs of factory certification are borne by local tea factories. Certification of tea factories gives local factories opportunity to charge price premiums for supplying certified tea

While the model was viewed by stakeholders as largely innovative and scalable, additional financial analysis needs to be undertake to ensure greater alignment of stakeholder incentives to participate in the model

Key outstanding questions for further analysis[1]

Detailed commercial feasibility analysis	- Further analysis and understanding of the financial model (e.g., detailed breakdown of programme costs and revenues; project IRR; returns to other stakeholders like IDH and RA) to understand commercial viability for all players involved - Explore potential for other financial intermediaries such as banks, venture capital funds, MFIs to participate in the initiative to improve financial viability of model
Concrete evidence on impact	- Evidence on impact/progress achieved to date on the programme (e.g., increase in Unilever's market shares through tea certification as a result of the initiative; whether planned targets in terms of tea production and number of farmers trained were achieved; impact on financial returns to farmers) - Evaluation and documenting impact will generate lessons to inform scalability and replication of the model across geographies and other commodities
Deeper understanding of project risks and mitigation strategies	- Further analysis and understanding of project risks for various stakeholders and potential strategies to mitigate these risks - For example, understanding farmers risk of assured product uptake in the absence of off-taker, and what impact is this likely to have on farmer income and incentives to participate in the programme

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016

Annexure

CASE # 1
UNILEVER SUSTAINABLE TEA

MNC **NON-PROFIT** **SUSTAIANBLE TEA** **RAINFOREST ALLIANCE CERTIFICATION** **VIETNAM (+ India and Africa)**

BUSINESS MODEL

- Unilever and IDH co-invests in trainings for SHF tea producers on Rainforest Alliance certification adoption and sources tea from RA certified farms

- Meet commitment and secure sustainability of their supply chain (Unilever)
- Complete its mission (IDH)

USAID FROM THE AMERICAN PEOPLE Dalberg

CASE # 1
UNILEVER RAINFOREST ALLIANCE TEA

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
AGRICULTURE				
Agronomy	Crop rotation, soil cover crop	0.98	0.51	1.45
Fertiliser and nutrient management	• Reduced use of chemical pesticides • Efficient and optimal use of fertiliser	0.62	0.02	1.42
Residue management	Use of residue as compost, rather than burning	0.72	-0.44	1.89
Set-aside	Fallow areas to recover natural fertility and interrupt pest life cycles	5.36	1.17	9.51

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Dalberg

CASE # 1
UNILEVER RAINFOREST ALLIANCE TEA

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)		
	AVERAGE	LOW	HIGH
Agronomy	0.98	0.51	1.45
Fertiliser and nutrient management	0.62	0.02	1.42
Residue management	0.72	-0.44	1.89
Set-aside	5.36	1.17	9.51

AREA (ha)	ER ESTIMATES (tCO2e/yr)		
	AVERAGE	LOW	HIGH
21,000	537,600	88,200	998,900
70,000	43,400	1,400	99,400
70,000	50,400	-30,800	132,300
14,000	75,040	16,380	133,140
TOTAL	706,440	75,180	1,363,740

ASSUMPTION

- List of mitigation activities based on internet search and assumption that the project follows strictly Rainforest Alliance/SAN standards
- Agronomy is applied to 30% of project area
- Fertiliser and nutrient management and residue management are applied to 100% of project area
- Set-aside is applied to 20% of project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

CASE # 1
UNILEVER RAINFOREST ALLIANCE TEA

CO-BENEFIT

CRITERIA	ACTIVITY
Productivity	Improved agronomic practices increase yield, e.g. crop cover, crop rotation
Soil quality	Soil conservation practices improve soil fertility, e.g. erosion control, soil cover
Water quality	• Wastewater treatment • agrichemical run-offs control, e.g. vegetative barriers • Prevention of sedimentation of water bodies
Biodiversity	Protection of natural ecosystem and endangered species

Knowledge brief #2

Sustainable agricultural production to access to key export markets

Rocky Mountain produces sustainable coffee in the Philippines

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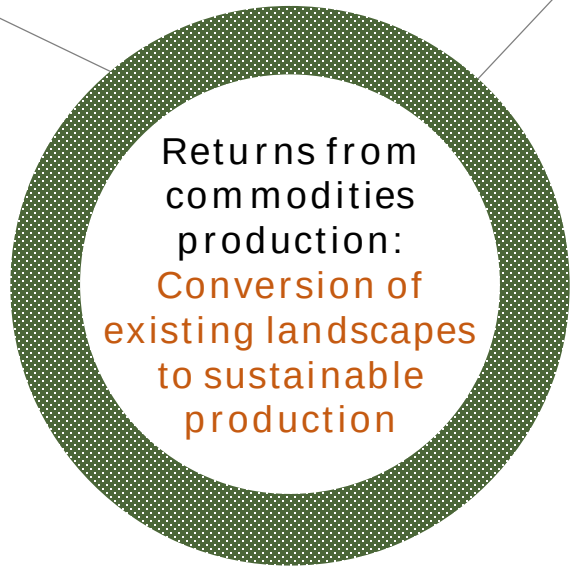
Dalberg

Rocky Mountain Arabica Coffee Company, in partnership with Tribe Company, is promoting a program to develop deforested land into coffee producing areas by helping small holders' adopt sustainable practices

Smallholder farmers and cooperatives in the mountainous regions want to stabilise incomes and move away from subsistence farming

- Potential solution: Smallholder cooperatives provide usufruct rights to land to Rocky Mountain and enter into contractual agreements for market access with an advanced purchase agreement
- Adoption of sustainable practices will lead to:
  - Advance purchase agreements guaranteeing incomes for farmers
  - Direct impact on increasing productivity therefore increasing yield and income
- Challenges:
  - *Access to funding:* High costs required for upfront investment to convert land for coffee production, technology, TA and inputs
  - *Transaction costs:* Requires presence of co-operatives to avoid high costs when dealing with smallholder farmers
  - *Gestation period:* 3 years to produce coffee during which no money generated



Rocky Mountain needs land to produce high-end Arabica coffee for export

- Potential solution: Rocky Mountain works with cooperatives to convert tribal lands from existing subsistence farming to high-end Arabica coffee production; producing for exports. Rocky Mountain receives usufruct rights to land in exchange for advanced purchase agreement with co-operatives
- Conversion of existing land to sustainable goods production will lead to:
  - Long-term market demand for high quality produce made through sustainable means
  - Increased incomes and markets for Rocky Mountain and smallholder farmers
- Challenges:
  - *High upfront investment:* To convert land for coffee production (e.g. drip irrigation)
  - *Access to finance*: Difficult to raise capital as Rocky Mountain doesn't own land to provide as collateral
  - *Gestation period:* 3 years to produce sustainable coffee during which no money generated

Conversion of existing land to sustainable goods production has high impact potential, but upfront costs may hinder commercial success and scalability

Criteria	Assessment	Scoring
Impact potential	- Potential for high GHG emissions reduction with adoption of proven sustainable agricultural practices. They reforest coffee in deforested areas and plant coffee between pine. They use natural fertilisers, wet process of coffee milling, LPF instead of fuel or diesel, recyclable carton boxes; an estimated 6,700 reduction tCO2e/yr[2] - Significant co-benefits: Increasing yield per hectare by 10x (yield increases from 200kg/ ha to 2000 kg/ha), and increasing farmer incomes by 40x (from $115 a month to c. $400 a month) - Impact potential may be muted depending on whether smallholders have been trained adequately to implement effectively to use sustainable methods of farming and increase yield	◑
Economic effectiveness	- Commercial feasibility is low: Although projections estimate 52% in returns, upfront investment costs are very high (c. $3k/ha). Requires donor funding to support the first 3 years until production can begin. Since Rocky Mountain charges smallholders full-price for all inputs (c. $1.5k/ha) and training (c. $150/ha), smallholders are required to raise large amounts of funding which will be difficult to replace with loans from commercial banks - Some economic effectiveness of the model as Rocky Mountain is incentivised since they are able to access export markets hence provide advance guarantee purchases. High demand for sustainable coffee with 25% of worldwide coffee sales sustainable in 2016[1] and likely to grow at a pace of more than 30%. Price premiums for high-quality sustainable supply make it possible to cover the high initial capital investments, which would be difficult to recover with other low-value commodities - Lacking clear track record of success of this model as no coffee sales have been generated from this model so far. However, there is evidence of successful implementation of the program as there are several pilot programs in different sites around the country (some sites more advanced than the others)	◑

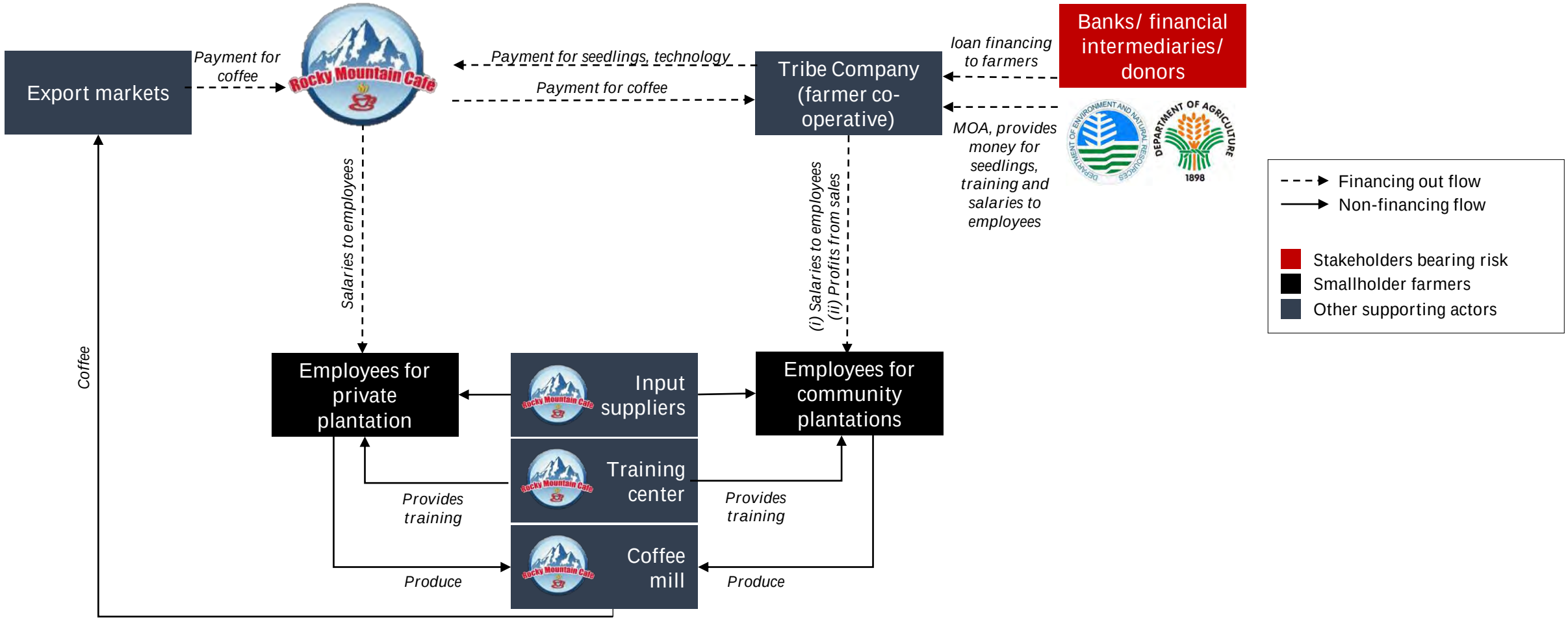
[1] IDH sustainable coffee estimates
[2] Refer to Annexure for detailed calculations

Scalability looks difficult due to the high upfront investment and in the context of other unfavourable assessment factors

Criteria	Assessment	Scoring
Innovation and scalability	- Innovative business model: Although sustainable production for export is a mature model, conversion of existing landscape is difficult. Rocky Mountain has over 10 sites across the country, however each site has high transaction costs and requires pilot testing (for every new group of farmers). Production is still not available for sale from any of the sites - Long lead time to be able to bring in commercial banks as potential long-term stakeholders. Donors have been heavily involved in providing capital for capacity building expenditures and training for smallholder cooperatives - Limited potential for scalability: Business model framework is not replicable across sectors and commodities, however can be scalable across geographies. High-end coffee is a valuable market hence end prices are able to cover up for the high initial costs of converting degraded land and switching to sustainable practices. Cheap domestic coffee and other similar commodities would not be able to absorb high initial capital expenditures or provide heavy returns on sustainable production - Interest among different stakeholders: Rocky Mountain has gotten commitment from different companies (e.g. mining companies) to help them convert degraded land to sustainable coffee production and other investors	
Other assessment factors	- Unfavourable enabling environment discourages stakeholder engagement: Difficult for private sector companies to raise capital if they do not own land in the country; currently, there is limited transparent funding available and lack of participation of large banks and other private sector companies - Presence of co-operatives required to aggregate small holders to include them in the RMACC program. Since Rocky Mountain does not own any land (and cannot own land in the country), they have to work with stakeholders that own land and continually convince them that converting land is better for them - Partner capacity is high since they already have sites around the country and partnerships with various companies, however the company is undercapitalised posing challenges making it difficult to scale	

[1] IDH sustainable coffee estimates

The key to successful implementation of this model lies in providing access to land to Rocky Mountain and providing capital to smallholder co-operatives to invest in training, technical assistance and seedlings



Rocky Mountain procures usufruct rights to land to produce sustainable coffee to access export markets in exchange for providing market access to smallholder co-operatives

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Rocky Mountain Cafe	- Connecting to networks - Capacity building - Providing intermediary services (training, milling etc.)	- Access to land to grow coffee since as a foreign corporation Rocky Mountain is not allowed to own land in Philippines - Secure long-term supply of sustainable commodities to: (i) access key export markets with ESG/ certification requirements (ii) meet demand for export market that pays a premium for high quality products; (iii) ensure stable supply of sustainably produced commodity - Increase customer base of farmer co-operatives to purchase Rocky Mountain's inputs supplies, training and milling services	- Significant initial upfront investment required for (i) development, drip irrigation and water supply ($5m. Per 1000 ha) (ii) maintenance from Y1-Y3 ($17 m. per 1000 ha) - Initial effort required to find appropriate farmer co-operatives as partners - Governance/ legal issues associated as private company does not own land	- Partnering with NGO for farmer aggregation and business development support - Securing upfront funding/ long term loans from donors for replantation and capacity building - Agro-forest management agreement signed to confirm usufruct rights to land - Production agreement signed for farmers to produce sustainable coffee on their land - Co-operatives sign purchase agreements to buy seedlings and management agreement to procure training from Rocky Mountain for a fee

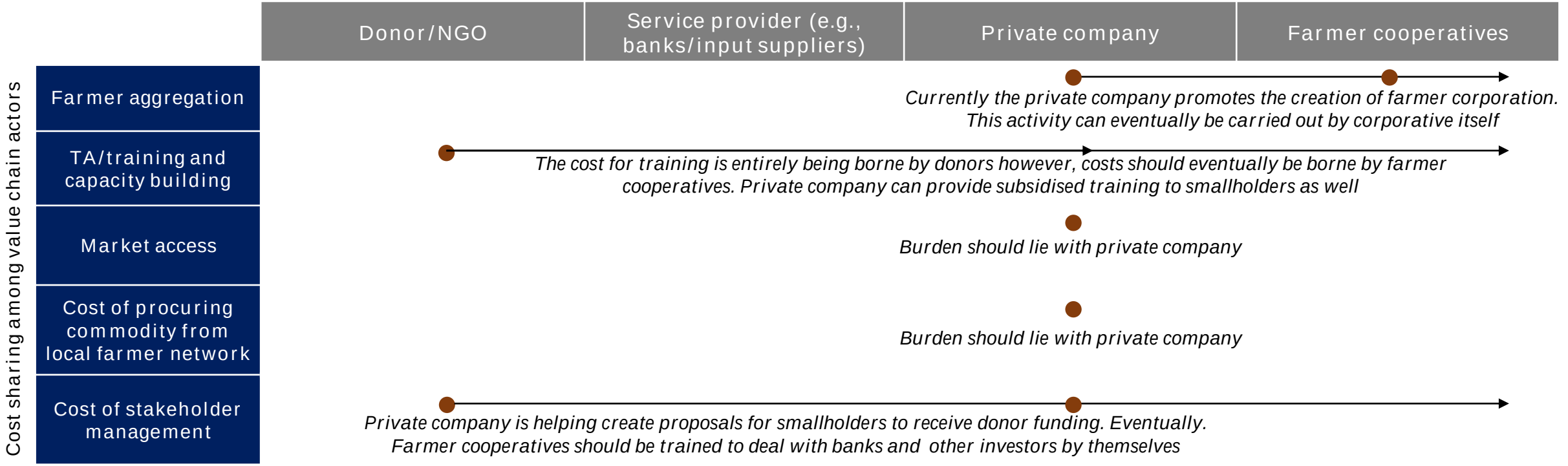
The project gives an opportunity to co-operatives and government to assist farmers increase incomes by moving to sustainable production of coffee while impacting large land cover

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Tribe Company (farmer cooperative)	- Provides access to labor - Provides access to land - Aggregates smallholders	- Increase incomes of farmers (40x) by (i) providing labor to Rocky Mountain (ii) employing farmers on their plantations (iii) increasing productivity (10x) - Get access to markets by receiving advanced purchase agreements from Rocky Mountain	- Access to capital for the smallholders co-operatives can be a challenge as banks are often unwilling to lend to SMFs because of high default rates - There is continuous donor support required to pay for technical assistance and technology	- Banks are more willing to lend to these co-operatives since (i) income is guaranteed by the Production Agreement (ii) biological assets can be used as collateral for loans - Reach out to investors that are willing to put up initial capital and receive payments after 3 years
Government	- Access to funding (for training, technical assistance and inputs)	- Create large scale impact on increasing sustainably managed forest cover		

Presence of financial intermediaries required to help finance large upfront costs for Rocky Mountain and co-operatives; also require to lend to co-operatives to pay for training, TA and input supplies

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Commercial banks/financial intermediaries	- Lend to smallholder co-operatives - Provide financial assistance to Rocky Mountain	- Mandate to lend to small holder farmers/ co-operatives: Banks may be encouraged to lend more to farmers under the RMACC model because of (i) advance purchase agreements from Rocky Mountain (ii) adopting sustainable practices is directly linked to productivity decreasing default rates - Receive returns by lending capital to Rocky Mountain and receive payments over the years	- High default rates among small holder farmers - High transaction costs in working with small holder farmers - Land required as collateral Private company is unable to take loans from bank since they do not own the land and are unable to provide collateral to banks	- Commercial banks may be willing to lend to co-operatives in this model since (i) income is guaranteed by the Production agreement signed by the private company (ii) Biological assets can be collateral for loans - Working with farmer cooperatives or other intermediary associations through branchless banking to reduce transaction cost - De-risking capital/guarantee fund from donors to reduce risk liability on banks and incentivizing them to lend to private company without land as collateral

Although this initial donor support is necessary, the cost bearing responsibility should gradually shift to the private sector in later phases as the model is validated within the local context



Change in cost bearing responsibility

Current burden of cost

Donors can provide funding directly to smallholder co-operatives or lend to Rocky Mountain under caveats that include providing training and managerial support at a subsidised cost to smallholders

Fund for capacity building and technical assistance for smallholders

- Currently the smallholders have to spend $140 per hectare in training and capacity building
- To impact 10k ha, the donors would need to partially fund US$1.4m
- The fund could specifically be used for training for agroforestry/ inter cropping
- The fund would specifically support training and capacity building for smallholders working on their own plantations

✓ The training costs will directly improve farmer productivity and adoption of sustainable practices

✗ Forms a very small percentage (6%-7%) of the total costs required for sustainable production

Guarantee fund to incentivise bank/ private companies to make loans

- The guarantee fund could be used as the first loss capital to make loans to: (i) co-operatives to invest in training and input supplies or (ii) Rocky Mountain without requiring land as collateral
- The loans will require a high gestation period as no coffee is produced in the first three years
- Upfront costs are c. US$70m for 10,000 hectares

✓ Will directly leverage private sector investment equal to or more than the value of the guarantee fund

✗ Large amounts of capital will be required as guarantee fund as private company is unable to provide collateral to banks

✗ Donor takes 100% risk of the loans

Fund to pool in money to provide loans

- Donors can be responsible for creating a fund to aggregate funds from smaller private sector players looking for impact investments
- Donors can put in the initial capital as first loss guarantee to catalyse private sector investments
- Loans provided to Rocky Mountain will have to include caveats to provide services like training to cooperatives at subsidised rate

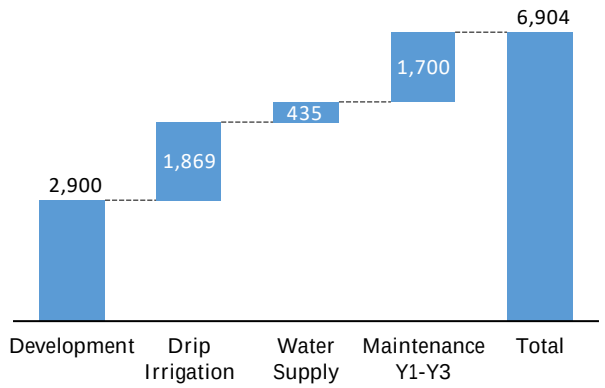
✓ Limited donor risk

✓ Small scale investors interested can contribute (e.g., LGT ventures looking to invest 1 million)

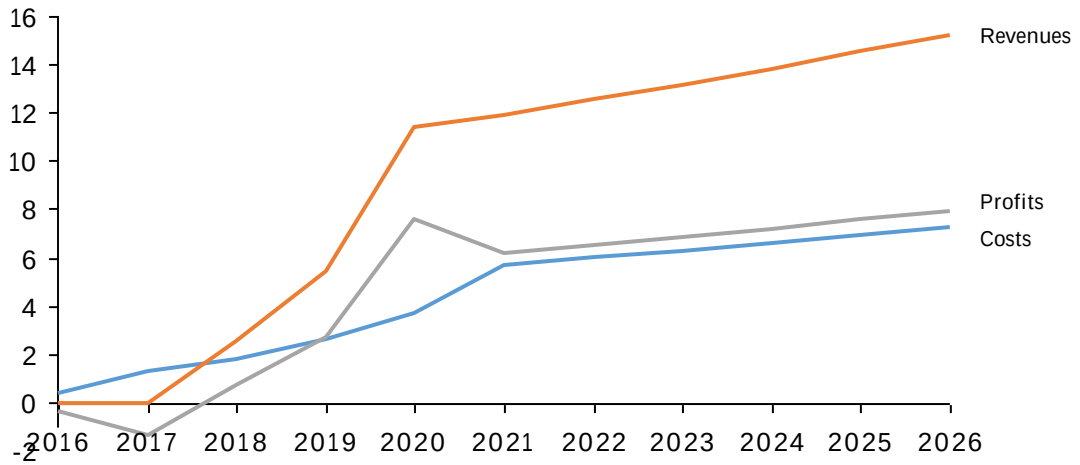
✗ Donors take first loss risk

The model has a potential to give net margins of 50% after Year 3 but require significant upfront investment with no revenue for the first three years

Capital Expenditures for 1000 Ha plantation
('000s)



Revenue, costs and profits for a RMACC inclusive model margin
(US$ per 1,000 ha)



High upfront costs limit scalability…

- Upfront investment is high: requires c. $6.9M for capital expenditures of development, drip irrigation, water supply and maintenance for 1000 hectares
- Payback period is c. 5 years because of high upfront costs and continuous operational costs

…but there is potential for high returns after three years

- No revenue for the first three years
- Gross profit margins are c. 30% in 2018 and continually increases to c. 67% for the next 10 years
- Net profit margins are c. 29% in 2018 and continually increase to c. 52% for the next 10 years
- 1.5 million trees are planted per 1000 hectares

Assumptions: Exchange rate of $1=46PHP is used for conversions; Inflation of 5% is accounted for; Price/ kg is determined by NYBOT ICE Arabica Coffee Index formula
Actual yield may vary because of climate and soil conditions

Annexure

CASE#2
ROCKY MOUNTAIN COFFEE

MEDIUM-SIZED DOMESTIC COMPANY

+

COFFEE

+

PHILIPPINES

BUSINESS MODEL

- Rocky Mountain invests in sustainable practices in its Arabica plantation in order to increase productivity and quality

- Export market access

CASE#2
ROCKY MOUNTAIN COFFEE

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
FORESTRY				
A/R	Crop cultivation - Reforest shaded trees and coffee in degraded area	1.2	NA	NA
AGRICULTURE				
Fertilizer and nutrient management	Efficient use of natural fertilizer and insecticide	0.62	0.02	1.42
Agroforestry	Intercropping	0.72	-0.44	1.89

CASE#2
ROCKY MOUNTAIN COFFEE

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/yr)
	AVERAGE
A/R	1.2
Fertilizer and nutrient management	0.62
Agroforestry	0.72

AREA	ER ESTIMATES (tCO2e/yr)
	AVERAGE
2,960	3,552
3,700	2,294
1,110	799
TOTAL	6,645

ASSUMPTION

- A/R accounts for 80% of project area (assuming that orginially the area was degraded area)
- Fertilizer is applied to all project area
- Agroforestry is applied to 30% of project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

CASE#2
ROCKY MOUNTAIN COFFEE

CO-BENEFIT

CRITERIA	ACTIVITY
Productivity	Improved productivity due to efficient use of agrochemical
Soil quality	Use of organic fertlizer helps maintain soil structure and increase its nutrient-holding capacity
Water quality	Lowered risk of water contamination due to reduced use of agrochemical, and use of coffee pulp which would otherwise dumped into river
Biodiversity	Biodiversity increases due to reforestation, avoided deforestation and shaded coffee plantation

Knowledge brief #3

Sustainable agricultural production to improve smallholder margins

Increased margins of corn smallholder farmers with Bank Andara in Indonesia

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Dalberg

Bank Andara, in partnership with Syngenta and Mercy Corps is promoting a programme to enhance small holders' productivity by helping them adopt GAP & providing them access to finance

Smallholder farmers and cooperatives need to increase productivity and quality of production for more income and better livelihoods

- Solution: Smallholder farmers receive high yield seeds and farm inputs and training on Good Agricultural Practices (GAP) by Syngenta. In addition, they are also receive financial literacy training and microfinance loans from their local bank. This ecosystem of support enables them to enhance their productivity
- Challenge:
  - *Lack of infrastructure:* Lack of irrigation facilities limit the farmers from multiple crop cycles and intercropping.
  - *Fear of inability to repay*: Unforeseen circumstances like droughts or family emergencies creates fear of inability to repay loans and reduces uptake
  - *Natural disasters:* the programme faced a drought in its second cycle that lowered the productivity but mitigation factors like crop insurance can reduce the risk

Bank Andara seek to strengthen the credit worthiness of the smallholder farmers to be able to extend loans to them

- Potential solution: Bank Andara, in partnership with Syngenta, Mercy Corps and BPR Pesisir Akbar, supports small holder farmers in Indonesia to enhance their productivity and increase incomes by helping them adopt sustainable and modern agricultural practices and giving them access to finance
- To ensure effectiveness, Bank Andara:
  - *Minimises risks* by (i) providing 40% of the loan in kind through Syngenta (ii) collecting repayments through local traders who provide advance purchase guarantee (iii) supporting training and capacity building
  - *Lowers transactional costs* by engaging a rural bank (BPR Pesisir Akbar) to disburse loans as microfinance loans to farmer cooperatives
- Challenge: Misuse of loans by smallholders, unforeseen local conditions, misalignment with one or more stakeholders can have a huge impact on the programme

While the model has high potential for commercial viability and scalability, the impact potential can further be improved by introducing practices like intercropping/ agroforestry (1/2)

Criteria	Assessment	Scoring[1]
Impact potential	- Potential for GHG emissions reduction with adoption of Good Agricultural Practices (GAP) – improved agrochemical use and efficiency; e.g., appropriate use and application technique; increase in productivity also leads to avoided deforestation, further impacting GHG emissions. an estimated 1k tCO2e/yr. reduction [1] but actual impact needs to be tested. environmental sustainability not the primary objective of the current programme but potential to introduce during scalability and replication, especially with commodities with higher impact on deforestation - Opportunity to further increase carbon sequestration through intercropping and agroforestry. Potential to intercrop corn with coconut. - Significant co-benefits: Assured and increased incomes for smallholder farmers through increased productivity; access to mainstream finance;	
Economic effectiveness	- High potential for economic effectiveness, given participation from multiple private sector stakeholders (i) Financing from Bank Andara; (ii) inputs ensuring increase in yield by 20% , training on GAP and technical support from Syngenta; and (iii) advance purchase agreements from local traders - Strong track record for commercial viability – c.11-23%[2] increase in productivity for ~800 farmers covering ~1500 hectares; c.US$250k[3] channelled in small scale loans to farmers with close to zero percent default rate and another c.US$3 m[3] committed by Bank Andara. - Risk mitigation through crop insurance for weather and natural calamities significantly improves the economic attractiveness of the farmers for the banks, but commercial feasibility for the insurer needs to be tested	

Assessments have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016; *[1] See annexure [2] Corn production has increased from 6ton/Ha to 6.6-7.2 ton/Ha for this programme; [3] Stakeholder meeting with mercy corps*

While the model has high potential for commercial viability and scalability, the impact potential can further be improved by introducing practices like intercropping/ agroforestry(2/2)

Criteria	Assessment	Scoring[1]
Innovation and scalability	- Mature and mainstream model that has been used by multiple stakeholders including banks, large MNCs and others to enhance the productivity of the farmers and increase returns on their investment in small holder farmers - High potential for scalability given the alignment of incentives of all stakeholders along the supply chain and financing commitment from Bank Andara and TA commitment from Syngenta; Advance market commitment from a larger off taker like Cargill could add to the ease of scaling. c.3-4 months start period for market access and capacity building at each new location (given stakeholder alignment already exists) before starting the pilot. About 8-12 months to complete a pilot. May be longer for other countries - Proven track record for scale: The programme is close to completing two successful cycles with approx. 800 smallholder farmers covering 1500 hectares of land and will scale to a 3rd cycle with 2500 farmers and 5000 hectares [2] - High potential for replicability to other geographies: (i) Having successfully tested their integrated corn supply chain partnership model in West Java with other partners, this programme was replicated in West Nusa Tenggara. (ii) Mercy Corp is also replicating a similar model with John Deree Foundation for rice farmers aiming to achieve 28% increase in income of 20,000 small holders by March 2018; Replication across countries may depend on	
Other assessment factors	- Strong partner network: Presence of bodies like PISAgro with an advanced working group for corn provides a platform for different stakeholders in the supply chain to invest together. Potential to replicate with working groups of other crops - More favourable enabling environment; large banks like Bank Andara and private sector companies like Syngenta have resources, capacity and network to secure land use rights/ permits from the government ; Corn among 7 crops to receive government support improve domestic production (reduced imports; increased minimum prices)	

Assessments have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016; [2] *Cycle 1 – total loans – US$ 250,000; hectares impacted – 385; Cycle 2: total loans – US$ 750,000; hectares impacted: 1600; Cycle 3: total loans – US$ 3 mil; hectares impacted – 5000*

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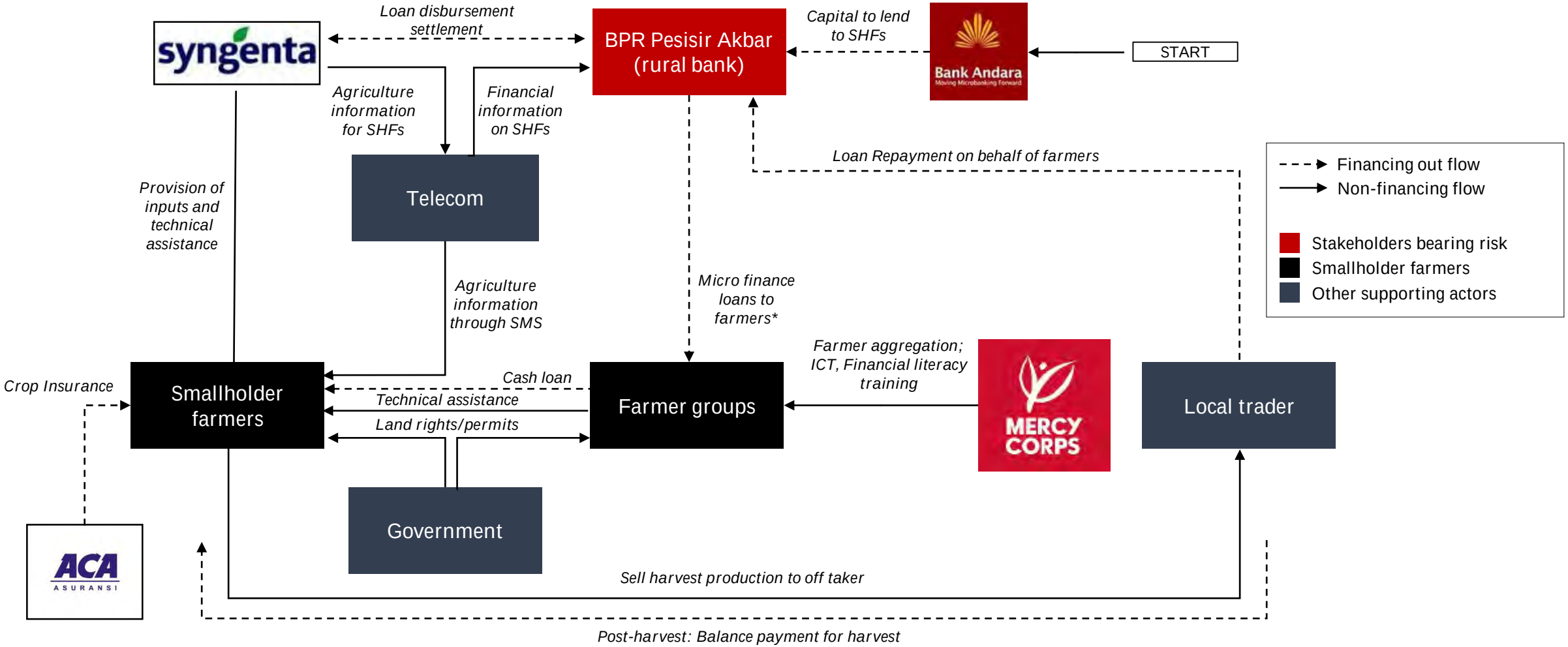
While Bank Andara and Syngenta drive the model, BPR Pesisir Akbar (rural bank) is the key risk bearing stakeholder in the model



Loans to farmers – IDR 8 m/ Ha; IDR 3.5 mil/ Ha in kind through Syngenta inputs; IDR 4.5 mil in cash for fertilizer, labor for land preparation and harvest, crop insurance premium, credit life insurance premium, and loan administration fees; IDR 13,000 = US$1

Financial support from Bank Andara and capacity building support from Syngenta and Mercy Corps mitigates the risks for BPR Pesisir such that it is willing to bear them

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Bank Andara Moving Microbanking Forward	- Access to finance: Provides a 1 year loan to BPR Pesisir Akbar at 1.5% interest per month to lend to small holder farmers identified by Syngenta and other local traders	- Opportunity to reduce risks associated with small holder farmers by increasing their productivity through sustainable agricultural practices.	- Inability of rural bank to repay loan: (i) high transactional costs (ii) high default rate from smallholders	- Leverage donor and other stakeholder support through MOU for (i) reducing transactional costs (ii) capacity building and financial literacy training of smallholders
BPR Pesisir Akbar *(Rural Bank)*	- Access to finance: - Pre-screening of farmer cooperatives, - Disbursement of loan at 1.8% pm: 60% in cash as microfinance loan and 40% as farm inputs through Syngenta - Receives repayment on behalf of the farmer from the local trader	- Opportunity to reduce risks associated with small holder farmers by increasing their productivity through sustainable agricultural practices.	- Risk of non repayment from small holders due to: (i) Less than expected increase in productivity; (ii) Loss of crops due to unforeseeable disasters; (iii) No assured returns/ income in the absence of advance purchase agreement; (iv) Requires land titles as collateral, but smallholders don't always have national land titles	- Leverage donor and other stakeholder funding for capacity building and financial literacy training - Crop insurance for small holders - Leverage advance purchase agreements from local trader

Access to new customers with reduced risks, is the key business driver for service providers like Syngenta, ACA and the telecom provider

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
syngenta	- Financing and capacity building: provision of (i) 20% higher yield seeds as a portion of loan; (ii) free training on GAP before plantation; (iii) free access to agro-economists for queries during and after plantation	- Access to new customers and increased future demand by enhancing productivity through training and good inputs - Reduced default risk on payments by tying up with a commercial bank	- Limited funds from CSR: cost of imparting and monitoring training. Challenge to scale up with CSR funding - Dependence of productivity on external factors like access to finance, local conditions, presence of off taker	- Include training and capacity building costs in mainstream business - Alignment with other stakeholders like local traders through MOU to ensure realisation of the increased productivity into income
ACA ASURANSI	- Access to finance: Provides crop insurance to small holder farmers through the farmer cooperatives	- Access to new customers in large numbers - Reduced risks as a result of better seeds, TA & access to finance for small holders	- Very small scale; does not make business sense for them unless they cover at least 50k hectares	- Enter partnership based on pilot test results - Leverage donor funding for de-risking capital
	- Access to networks - Links Syngenta and smallholder through SMS and provides information to rural banks	- Access to new customer - More revenue per customer	- No additional risk from the programme	- No additional mitigation strategy for the programme

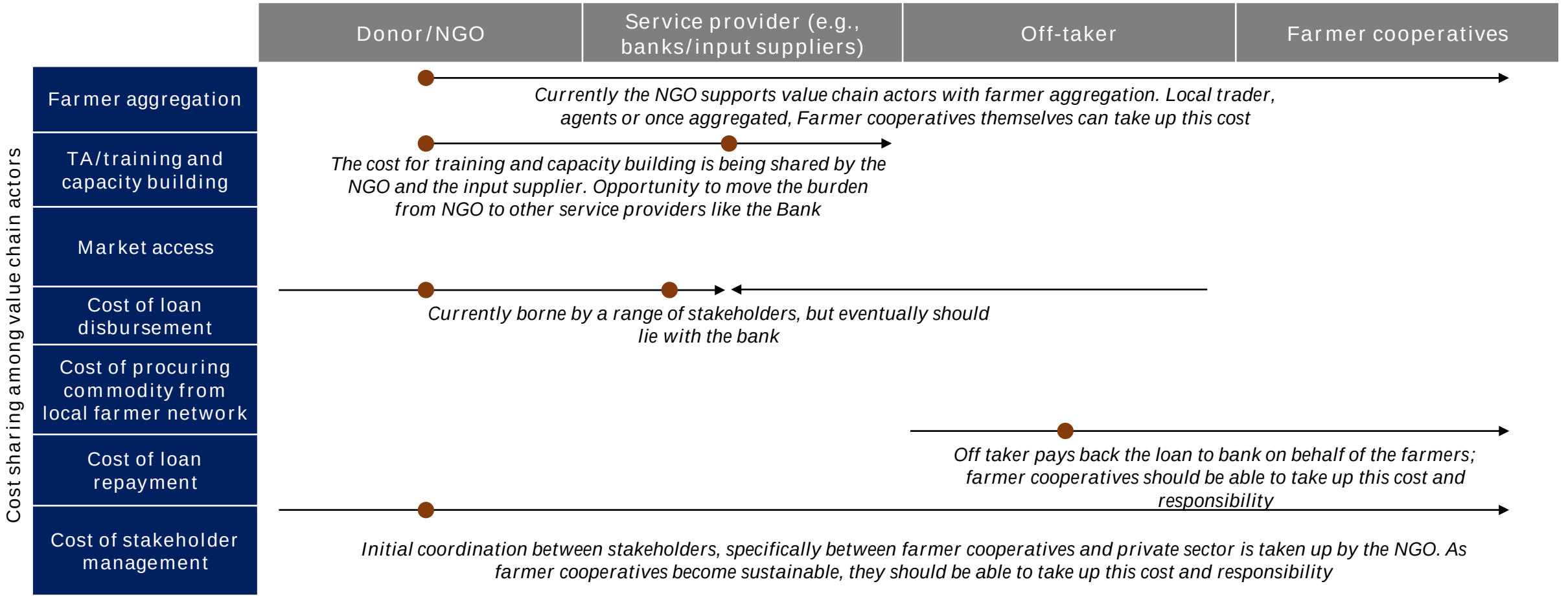
The model provides strong potential for smallholder farmers to increase corn yields; earn long-term income; and strengthen their capacity to access mainstream services

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Smallholder farmers/ cooperatives	- Capacity building: - Ensures adoption of GAP among members - Facilitates sale of harvest and payments to members and loan repayments to banks	- Increased incomes for members: Incentivised to enhance productivity to increase incomes & improve livelihoods - To become self sustainable: increased productivity also leads to increased business and self sustainability of the cooperative	- Risk of not getting assured increase in productivity and not being able to repay loans - Requires considerable training to follow good agricultural practices for growing corn - Lack of national land titles for collateral	- Leverage donor and other stakeholder funding for capacity building and financial literacy training - Crop insurance for small holders - Leverage advance purchase agreements from local trader
MERCY CORPS	- Capacity building: financial literacy training - Access to Network: coordination between various stakeholders and linkage to smallholders - Technology support: mobile app development for crop monitoring and farmer communication	- Social and environmental impact: Create long term economic, environmental and social sustainability impact on small holder farmers	- Lack of traction from private sector stakeholders: May not join or complete the programme without seeing immediate results - Inability to scale or replicate the programme	- Incentivise private sector stakeholders to share the cost of the programme - Document, share and improve practices for easier scaling up and replication

Assurance from Syngenta on enhanced productivity incentivises local traders to offer advance purchase guarantee to farmer cooperatives

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Local trader	- Access to network: link between smallholders and larger buyers by providing advance market commitments to smallholders	- Supply of more and better quality of corn - Freed up capital: Capital earlier going to farmers as loan now available for better investment opportunities	- Risk of not receiving expected quantity of corn – farmers may sell to others, productivity may not increase as much, may be low quality	- Engage with smallholders, especially on post harvest practices to build trust and ensure quality

Although this initial donor support is currently still necessary, the cost bearing responsibility should gradually shift to the private sector in later phases as the model is validated within the local context



We came up with three potential options through which donors and multilaterals could catalyse private sector investments in this programme

Fund for capacity building and technical assistance

- Estimate from current case study suggest that approximate cost for GAP training and capacity building will be US$ c.11.5 per hectare[1]
- To impact 6500 hectares will require US$ 75K for one cycle of 8-9 months
- The fund could specifically be used for training for agroforestry/ inter cropping and other such ER practices

✓ A part of this training cost is already shared by private sector stakeholders like Syngenta

✓ Potential to include the off takers and banks to share some costs

✗ May not directly leverage as much private sector investment

Guarantee fund to bank to make more loans

- Currently the programme makes an average loan of US$ 615 per hectare and the average default rate is 0%
- To reach 6500 hectares, the donors would need to provide a fund of US$ 250k as loan guarantee for the pilot phase, post which bank will fund the next cycles. [2]
- The guarantee loan could be used two ways: i) To push Bank Andara to make loans to more 'risky'[3] farmers. ii) To add a new bank to the programme that would otherwise not lend to smallholders

✓ Pilot cycle had 0% default rate; given this trend the actual fund utilised may not be much. Could then be used as a rotating fund for more loans

✓ Will directly leverage private sector investment equal to the value of the loans

✗ Donor takes 100% risk of the loans.

Capital injection to banks to make more loans

- In the current programme, Bank Andara has made a capital injection of US$ 250k to rural banks at a rate of 1.5% interest rate
- Donors could consider a similar injection of capital for mature programmes that have proven success through pilots
- Under this programme, to impact 6500 hectares, the donors will need to inject a capital of US$3.75 m

✓ Donor takes no risk for the loan

✓ The capital injection can bring scale to existing successful programmes and motivate other financial organisation to participate. If successful, the new FIs can continue to lend to other farmers

✗ May have less flexibility to change/ add to the programme if it is already established

[1] IDR 150,000 per hectare by Syngenta (information from Mercy Corps)
[2] Cycle 1 – total loans – US$ 250,000; hectares impacted – 385; Cycle 2: total loans – US$ 750,000; hectares impacted: 1600; Cycle 3: total loans – US$ 3 mil; hectares – 5000
[3] 'Risky' would include farmers with no collaterals, low productivity

....however following the workshop group discussion, these options were refined to fit into four large buckets of donors/ multilateral support to catalyse private investments in the programme

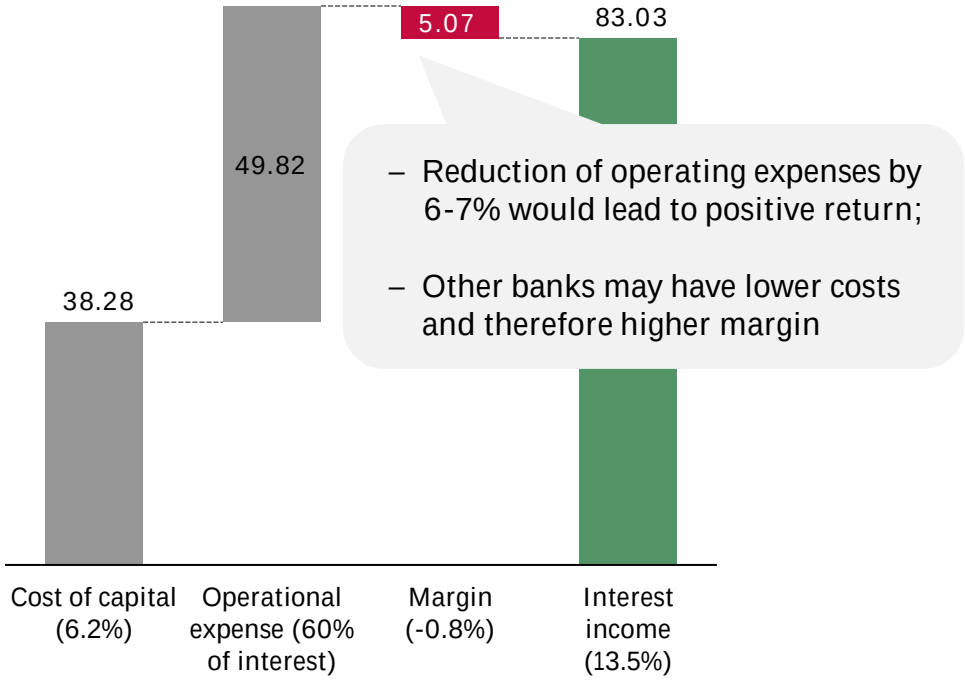
	Potential role for donors/ multilaterals
Capacity building and technical assistance	- Institutional capacity building support for business development service providers; financial institutions; farmer training and capacity development, other government and regulatory stakeholders (e.g., supporting financial institutions to work with smallholders to operationalise these models to achieve their commitments; support implementing NGO with capacity building grant to develop farmer skills and to meet ESG and sustainability requirements)
Financial interventions	- Initial de-risking capital or loan guarantees to incentivise other commercial banks and insurance companies to provide financial access and insurance to smallholders (e.g., providing first loss guarantee; high transaction costs of farmers training, entering into advance purchase agreement with farmers for commodity supply, etc.) - This is to help support prototyping and demonstrating an effective multi stakeholder model that can achieve climate change goals and generate commercial returns at the same time
Convening platform	- Set up a platform or provide funding to facilitate stakeholder collaboration and discussion on similar models to create greater market incentives for stakeholders to work with smallholders - Connect smallholder farmers with off-takers to strengthen incentives for smallholders to participate in the project and get assured returns
Impact monitoring and evaluation	- Support M&E and impact assessment of the model (e.g., impact on emissions reduction, farmer incomes) to generate learnings for project scalability and replication

[1] Options for potential support have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016

The model has potential to return a positive margin for the commercial bank, given the ability of farmers to repay their loans with zero default – though bank's operating expenses may become a barrier

Costs and margin for Bank Andara per loan per ha

US$/Ha



– Reduction of operating expenses by 6-7% would lead to positive return;

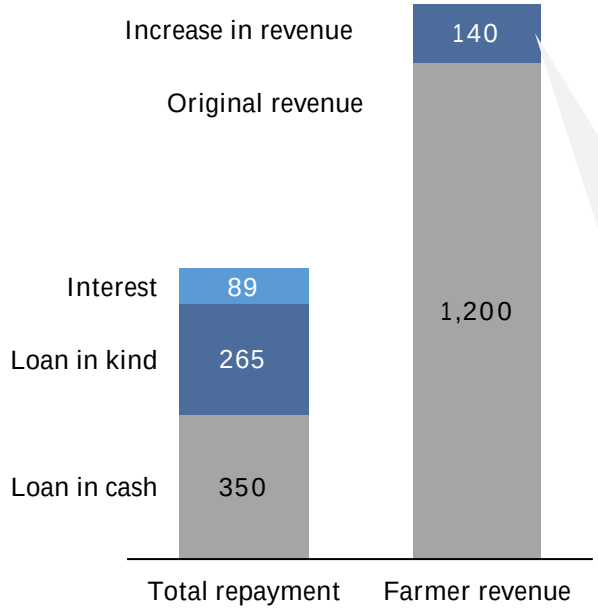
– Other banks may have lower costs and therefore higher margin

Assumptions

Average loan size per hectare = USD 615[1]; time period = 9 months[1]; interest rate = 1.5% pm[1]; Cost of capital = 8.3% pa[2]; Operating expenses = 60% of interest income [2]

Annual loan repayment vs farmer annual income[1]

US$/Ha



Loans from banks enable farmers to buy inputs; In addition, the programme provides access to better inputs at same cost resulting in:

– increased farmer incomes

– zero default rate

Assumptions

Interest rate by rural bank = 1.8% pm; time period = 8 months; Original corn productivity = 6 ton/ha; avg. Increased productivity = 6.7 ton/ha[3]; avg. price for corn = US$ 0.2[4]

[1]From stakeholder meetings with Mercy Corps; Conversion rate: US$1 = IDR 13000; [2]Approximates from quarterly report for Bank Andara (2015); [3] Weighted average of 7.2 ton/Ha in cycle one (385 Ha) and 6.6 ton Ha in cycle 2 (1200 Ha); [4] Weighted average of IDR 2200/kg in cycle 1 and IDR 2700/kg in cycle 2; conversion rate US41 = IDR 13000

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While the model was viewed by stakeholders as largely innovative and solutions oriented, additional financial analysis needs to be undertake to ensure greater alignment of stakeholder incentives to participate in the model

	Key outstanding questions for further analysis[1]
Stronger focus on impact	- Further understanding of potential to build an ER measurement component in the programme and provide evidence on impact achieved to date - Further analysis on potential for uptake on sustainable practices by smallholders without it being a requirement from local off taker
Concrete evidence on commercial feasibility	- Evidence on commercial feasibility for Bank Andara and ACA (crop insurer) to raise interest among other banks and insurers (key stakeholders for this model) - Test commercial feasibility for other commodities with higher implications on deforestation but lesser support from the government/weaker enabling factors (no price support or import restrictions from the government) - More capital for convening platforms or on ground partners to do stakeholder management
Potential for stakeholder alignment and participation	- Further analysis of potential for such stakeholder alignment in other geographies, specifically other countries (e.g. potential for crop insurance in Vietnam – currently non existent for smallholders, interest of commercial banks/input suppliers to participate given weak enabling factors in other countries) - Further potential to crowd in more off takers, especially those committed to sustainable commodities, to strengthen incentives for farmers to adopt sustainable practices

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016

Annexure

CASE # 3
BANK ANDRA CORN MICROFINANCE

INPUT SUPPLIER | **ANDARA BANK & RURAL BANK** | **NON-PROFIT** | **INSURANCE PROVIDER** | **CORN** | **INDONESIA**

BUSINESS MODEL

- Syngenta, Bank Anadara, Mercy Corps, ACA Insurance, and BPR provides a bundled services to corn farmers (TA on finance and agriculture, micro-loan, crop insurance, digital payment and market access)

- To increase productivity

CASE # 3
BANK ANDRA CORN MICROFINANCE

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
AGRICULTURE				
Fertilizer and nutrient management	Improved agrochemical use and efficiency, e.g. appropriate use and application technique	0.62	0.02	1.42

CASE # 3
BANK ANDRA CORN MICROFINANCE

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)		
	AVERAGE	LOW	HIGH
Fertilizer and nutrient management	0.62	0.02	1.42

AREA (ha)	ER ESTIMATES (tCO2e/yr)		
	AVERAGE	LOW	HIGH
1,585	982.7	31.7	2250.7
TOTAL	982.7		

ASSUMPTION

- List of mitigation activities based on internet search
- Fertilizer and nutrient management is applied to total project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation potential of each activity for calculation

CASE # 3
BANK ANDRA CORN MICROFINANCE

CO-BENEFIT

CRITERIA	ACTIVITY
Productivity	The project aims for increased productivity target of 8 tons/ha through efficient use of agrochemicals, additional to other practices.

Knowledge brief #4

Sustainable forest management via forestry commodities production

FSC certification in Indonesia with support from The Borneo Initiative

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Dalberg

By getting FSC certified, timber concessions[1] will be able to access export markets through domestic suppliers

Timber concessions[1] want to move into upmarket export markets for certified wood to increase sales and earn price premiums

- Current solution: The Borneo Initiative (TBI) provides funding support to timber concessions to apply for certification. It also provides access to technical advisors and certification bodies
- Challenge:
  - *High certification costs:* upto US$1.1 m for a 100k ha concession, Limited donor funding; banks not willing to lend due to unattractive economics for concessions
  - *Limited supply:* despite certification of entire plantation, only a few species are in demand in the export markets
  - *Lack of guaranteed buyer or favourable market conditions*

Banks/ financial institutions seek to strengthen and capture timber concessions for their products and services

- Potential solution: Commercial banks provide access to finance to timber concessions to apply for certification. FSC certification can lead to increased revenue for these concessions through access to export markets and price premium on certified products, thus improving their credit quality/reducing default risk
- Challenge: *Limited increase in revenue* due to limited supply of demanded species and *weak enabling factors* for concessions, like restrictions on selling raw timber to export markets; low raw timber prices

Domestic buyers seek to secure a sustainable supply of certified timber from timber concessions to be able to sell to export markets and earn a price premium

- Potential solution: Domestic buyers cover a part of certification costs through direct funds or by providing advance market commitments with price premiums.
- In the longer run, provide support for reforestation for more favorable species for export markets and therefore for certification
- Challenge: Limited supply of demanded species per concession do not justify the funding for certification costs in the short run. Fluctuating demand and changing enabling environment prevents them from long term investments

[1] Case study focuses on natural forest timber concessions. TBI has only worked with those in the past; currently working with 2 plantation concessions but not completed the process yet and do not have concrete results. Until recently, number of plantation concessions eligible for FSC certification have been very limited in Indonesia – only plantations licensed prior to 1994 (before FSC certification became operational) and ones licenced after 1994 for land deforested by smallholders/natural causes are eligible; limited number of both in Indonesia; but an increasing interest in the latter in recent years; While the over all FSC certification process is largely similar, high level differences between the two have been highlighted in the "Assessment' slide and in the relevant footnotes. However, deeper analysis required to understand more detailed differences between the two.

The model has huge potential for immediate GHG emissions reduction but will become commercially viable only in the long run with more supportive enabling environment (1/2)

Criteria	Assessment	Scoring
Impact potential	– Potential for high GHG emissions reduction with adoption of reduced impact logging practices as a requirement for FSC certification; Impacted 1.4 mil Ha through certification; additional 2.8 mil Ha under process; an estimated c.8.6 mtCO2e/yr. reduction; However no formal criteria to measure GHG emission reduction in FSC requirements – Emission reduction impact may be higher for plantation concessions due to replantation of degraded lands and much shorter logging cycles hence higher carbon sequestration but the size of the difference still remain to be tested – Indirect impact on GHG emission reduction by acting as buffer zone for protected area: 17 of the 41 TBI supported natural forest timber concessions (1.36 million ha) share borders with a protected area and thus act as buffer zone [2] – Significant co-benefits: Improved conditions for local communities (this is a prerequisite for FSC certification and is monitored by Certifying Body in the certification process); soil conservation and erosion control, protection of natural water courses and water catchments; in addition 16 forest concessions offer habitat for such iconic endangered species like orangutans, proboscis monkeys, elephants and Sumatran rhinos;	●
Economic effectiveness	– Lower potential for short term commercial feasibility: High certification costs of up to US$c.1.1 m per 100k Ha; Despite high price premiums for the industry (anywhere from 5% - 30%) [2] very little passed on to timber concessions due to their limited supply of export demanded species, therefore low negotiation power – Potential for long term commercial feasibility: With long term financing from banks and/ or support from domestic suppliers, concessions can convert to highly demanded certified species in the export markets, increasing negotiation power for price premiums – 5 years to recover cost at 12% price premium: With 50% of concession production (at 0.5 m3/ha/yr.) [1] being exported at an average of 12% price premium [3] for a period of 5 years (validity of the certification), the natural forest concession can recover costs by the end of 5 years [4] – Higher potential for commercial feasibility for plantation concessions vs natural forest concessions due to more control on type of species grown and more uniform land – leads to lower operating costs because of better management and lower encroachment and higher revenues due to much higher yield per hectare (do not require to do selective logging by FSC) [5]	◑

Assessment scoring has been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016; [1]Refer annexure; [2]Information from The Borneo Initiative stakeholders; [3]Trade Survey 2014 – The Borneo Initiative; [4]Total co 5 years = US$1.1 mil; Total revenue = US$11 m (both at NPV discounted at 10% long terms loan rates). To recover costs in 5 years require a premium of 12%; [5]TBI has or worked with natural forest concessions in the past; is considering working with plantation concessions in the future

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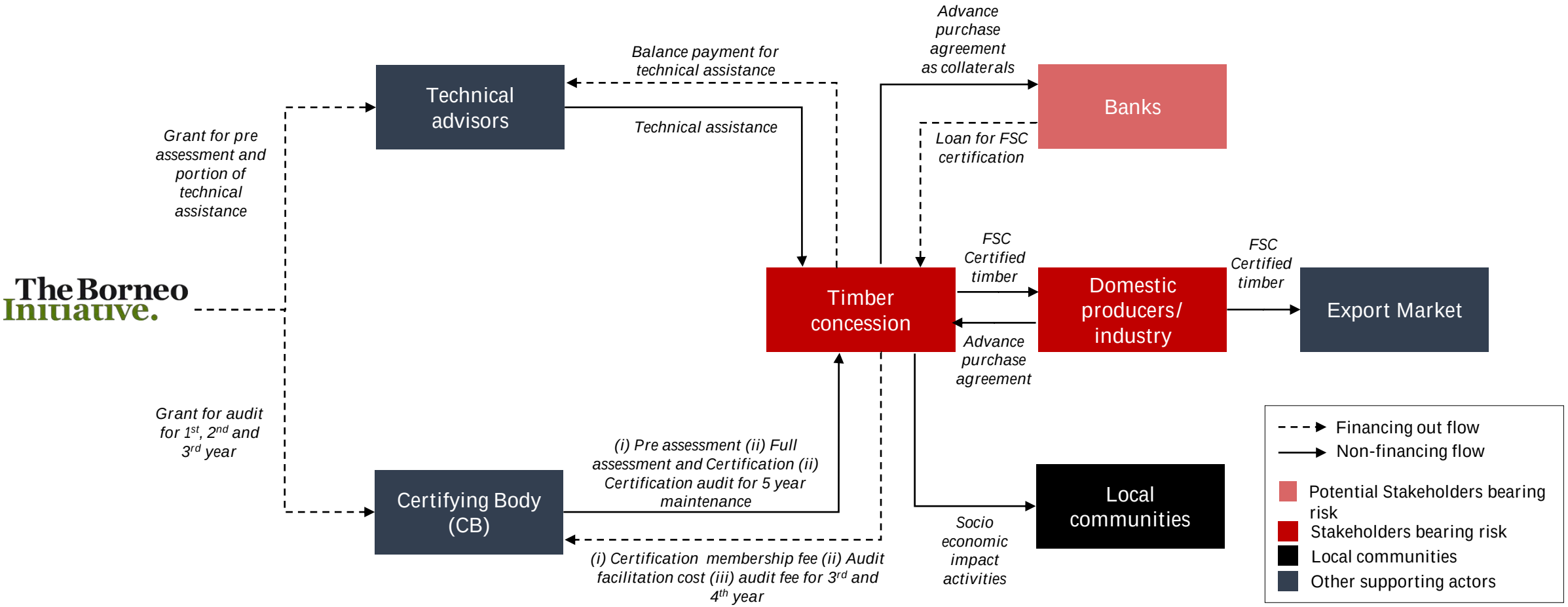
The model has huge potential for immediate GHG emissions reduction but will become commercially viable only in the long run with more supportive enabling environment (2/2)

Criteria	Assessment	Scoring
Innovation and scalability	– Mature and mainstream model for natural forest timber concessions with clearly defined standards for FSC certification – Model relatively new for plantation based concessions, specifically in Indonesia. Potential to be much more commercially feasible for plantation concessions but still needs to be tested[1] – High potential for scalability – business model easily scalable to other natural forest timber concessions with access to finance. TBI has earned certification for 1.4 million hectares in Indonesia since 2010 through 17 concessions and is in the process for receiving certification for additional 2.8 million hectares by 2017 through 21 other concessions[2] – Potential for replicability to other commodities with predefined certification standards, however process will vary based on industry and local nuances	
Other assessment factors	– Mandate from government to adopt sustainable timber logging practices (SVLK); therefore economic incentive for concessions to push further and apply for FSC certification; – Existence of credible/capable partners: TBI has successfully supported, with its well established network of 7[2] certification bodies, 5[2] certification coaches and 24[2] subject matter experts, 19[3] concessions in receiving FSC certification and is in the process for 21[3] more in 2016 and 2017; However lack of technical partners outside of TBI partnership – However, unfavourable industry conditions for timber concessions : (i) Limited demand for FSC certified wood, especially post 2008 recession and as China continues to expand as a market with no sustainability requirements (ii) Ban on timber concessions in Indonesia to sell raw timber directly to exporters, mandating them to go through domestic buyers thus reducing their negotiating power	

Assessment scoring has been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016; [2]TBI website; [3] Stakeholder meeting with TBI

The certification process involves high costs and a complex process – while a well established network of supporting actors exist to support timber concessions in the process, access to financing is still limited



Although timber concessions are able to access export markets with FSC certification, they cannot export to them directly, as a result, losing large part of the price premium to the domestic off takers

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Timber concessions	- Finances certification costs: Invest 50% or more financing for FSC certification - Capacity building for certification: with support from technical advisors, builds capacity of its unit to meet certification criteria	– Increase in profits and margins by accessing to export markets	– No direct access to export markets - ban on concessions to export directly; dependent on domestic buyers – Limited financial support to meet certification costs: (i) Limited internal funds due to low margins; (ii) Lack of access to formal financing; (iii) Limited donor funding	– Ensure compliance with minimum government requirements for sustainable logging to be eligible for further funding from NGOs and banks – Provide better incentives to workers to reduce turnover

Domestic and Export market off-takers	- Connect to network: Domestic off taker buys FSC certified timber from concessions to sell to exporter markets at price premiums (5% - 30%)
	- Potential to finance certification costs by providing direct funding, price premiums or advance market guarantee to serve as collateral for loan
		– Domestic: Access to export markets:
		  – Larger market
		  – Price premium on certified timber
		– Export market: Secure supply of certified timber to maintain band reputation to meet global sustainability targets
			– Domestic: mismatch in species demanded by export market & species supplied by certified concessions therefore buy from multiple concessions; cannot afford certification costs for all
			– International: changing macro conditions impact business' capacity to spend on environmentally and socially impactful activities and products
				– Support international organisations like TBI, FSC, ITTO to increase awareness about different FSC certified timber species
				– Vertically integrate and invest long term in concessions to secure relevant supply

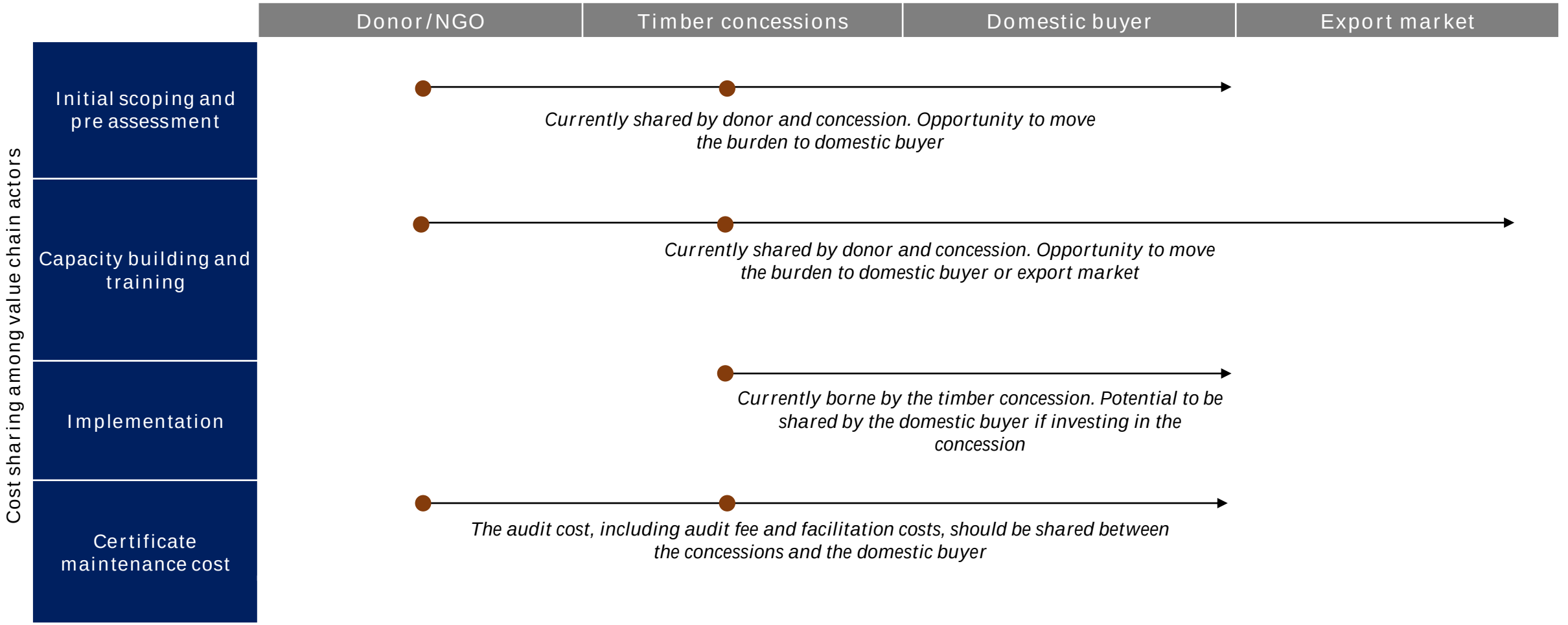
The Borneo Initiative and technical advisors coordinate to provide funding and capacity building support to the timber concessions to help them adopt sustainable practices and receive FSC certification

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
The Borneo Initiative.	- Finances certification costs: Co-funds up to $3/Ha for FSC certification process – initial scoping; third party TA and certification audit fee for first 3 years - Connects to networks: Market linkages with export markets to domestic buyers	– Opportunity to reduce environmental impact of timber logging by introducing sustainable practices through FSC certification	– Lack of funding to support all concessions – Unfavorable industry regulations and economics that demotivate concessions from applying for certification	– Work with FSC to increase awareness about FSC certified goods and therefore increase demand
Technical advisors (lead and others)	- Capacity building for certification: Initial scoping; development and implementation of CAP; addressing CARs suggested by CB	– Opportunity to increase social and environment impact for non profit advisors – Access to additional customers for for-profit consultants	– High turnover rates in concessions may impact their results on capacity building	– Document processes to ensure easy transition

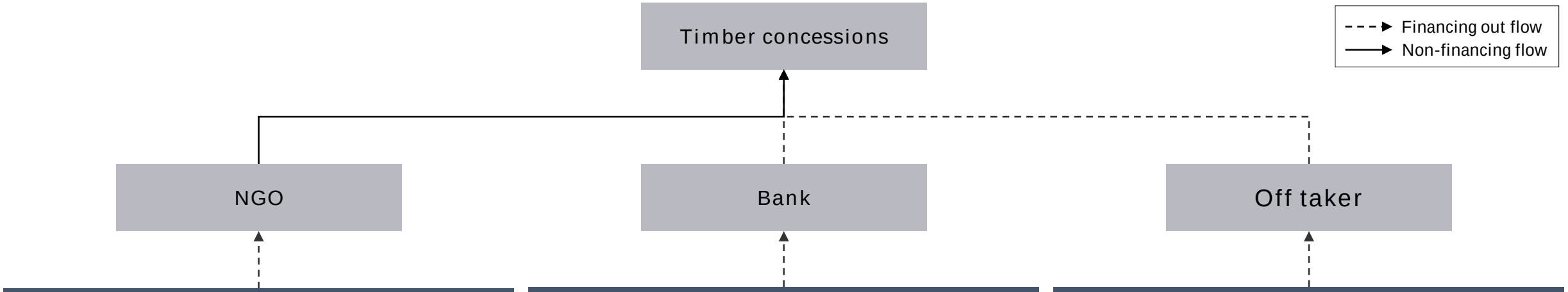
The model provides an opportunity for banks to lend to timber concessions by reducing their risks with leverage from other stakeholders and by designing favourable terms for concessions

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Banks/ financial institutions	- Potential to finance certification costs: pre-defined selection criteria; favorable loan design for concessions; monitoring of loan for certification costs	– Access to new customers that would otherwise be risky	– Unfavorable industry regulations for timber concessions, making them unattractive customers – Lack of minimum standards for selection criteria in concessions. Could be due to lack of capacity, funds or weak enforcement of the regulations	– Leverage donor funding as guarantee fund – Design favorable products for concessions to reduce their risk of default, e.g. long term loans – Leverage other stakeholders including CB and domestic off taker to reduce risk of lending
Certifying body (CB)	- Capacity building for certification: Pre assessment; Corrective Action Requirements (CARs) after implementation; Monitoring of CARs and delivery of FSC certification - Annual audit inspection during certificate validity	– Certification fee and audit fee from certified concessions	– FSC requirements not contextualised to local standards therefore high costs for conducting assessments and complications in maintaining global standards	– Work with FSC and other certification standards to simplify and contextualise global certification standards for Indonesia

For long term sustainability of the model, the concessions need to be able to cover certification costs through private sector financing



We came up with three potential options through which donors and multilaterals could catalyse private sector investments in this programme…



Role 1: Fund for capacity building and training for certification	Role 2: Guarantee fund for bank to make long term loans to concessions	Role 3: De-risking capital to off taker to invest in concessions
Grant funding to finance capacity building for concessions applying for certification. Potential to channel funds through TBI at $3/ Ha.	Incentivise banks/financial intermediaries to increase access to finance to timber concessions, including to riskier counterparties - Loan default guarantees as security to lender to de-risk credit exposure - Injection of capital to improve bank balance sheet and increase disbursements	De-risking capital to domestic off taker to make long term investments in timber concessions, which would include certification costs and replantation of more demanded species

....however following the workshop group discussion, these options were refined to fit into four large buckets of donors/multilateral support to catalyse private investments in the programme

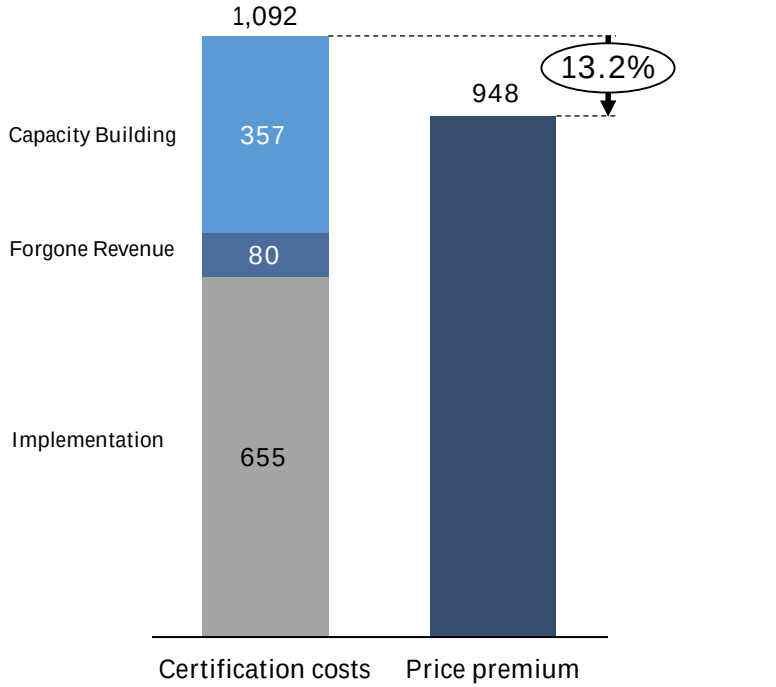
	Potential role for donors/ multilaterals
Capacity building and technical assistance	- Institutional capacity building support by funding/ developing more technical assistance providers. Support with identification, training and verification of these TA providers and with access to networks to connect them to donors, certifying bodies, timber concessions and other stakeholders in the supply chain
Financial interventions	- Initial de-risking capital or loan guarantees to support financial institutions to provide long term loans to timber concessions - Test potential for results based financing for certification costs: efficient mechanism to reduce associated risk for the financial institutions/ donors, along with providing more flexibility to concessions to utilise funds
Support for enabling environment	- Lobbying with Chinese government to pass regulations supporting sustainable supply chains and requirement for certification - Facilitation of standardisation between different certifications to harmonise the process and increase uptake - Support for sustainable landscape approach to enable sharing burden of some costs (capacity building of local community, working with provincial government) with other stakeholders in the region
Impact monitoring and evaluation	- Support M&E and impact assessment of the model (e.g., impact on emissions reduction) to generate learnings for project scalability and replication

[1] Options for potential support have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016

Natural forest timber concessions[1] require financing of US$1.1m per 100k hectares to cover 5 year certification costs, which they can recover with an average price premium of 12 % within the validity period

FSC certification costs & price premium for the 5 year validity period[1]

US$/100k ha



Current yield & price economics not enough to cover certification costs..

- Average yield = 0.5 m^3 /ha^2
- Average log price = \$100/m^3
- Average price premium for certified wood = 10% (ranges between 5% - 30%)
- Only 50% of the total yield is exported; balance is either sold domestically or is waste; no price premium in both cases
- All cost changes due to certification application are included in the cost of certification

...however small improvements can cover the gap and increase bankability

- Potential to cover the cost-revenue gap through:
  - Increase in price premium by 2% - from 10% to 12%
  - Increase in % of yield exported by 10% - from 50% to 60%
  - Reduction in cost by 13.2% - Concessions working with TBI have been able to reduce capacity building costs to US$1/ha implying a reduction of 23%
- Potential for banks to provide long term loans with some donor support

[1]The commercial feasibility for plantation concessions may be much higher due to uniformity of land and better control the species grown; Control on land reduces, encroachment and illegal activities by local community, makes management easier, thus reducing operating costs; FSC certification for plantations also does not require them to do selective logging, therefore simplifying the certification process. In addition, while the value of plantation wood is lower due to smaller diameters and less density, overall volume of wood per hectare is much higher, adding to the ease of commercial feasibility; [2]Information provided by The Borneo Initiative

While the model was viewed by stakeholders as an important initiative for large scale ER impact, additional factors, like growing Chinese market, need to be considered to analyse the impact on commercial feasibility

Key outstanding questions for further analysis[1]

Detailed commercial feasibility analysis	- Further analysing to understand the difference in commercial feasibility for natural forest concessions and plantation concessions. Commercial feasibility much higher for plantation concessions due to better control on type of species - Factor in the impact on price premiums as supply of FSC certified timber increases. Analyse the potential for increasing the average industry price for certified wood, thus reducing dependence on price premiums
Risk to realising potential impact	- More information on The Borneo **Initiative's** M&E strategy due to absence of M&E criteria for GHG emission reduction in FSC certification - Test potential for long term sustainability: threat for certified/ sustainable timber with increasing dependency of timber concessions on Chinese market (with no regulations supporting sustainable supply chains)
Other considerations	- Potential to standardise multiple certifications to simply compliance and increase uptake - Potential to apply a landscape approach with other forest concessions and agricultural lands to share costs (e.g., capacity building of local community in the region, coordination with provincial/local government for support, etc.) and lift up over all production standards

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016

Annexes

CASE # 4
BORNEO INITIATIVE FSC TIMBER

INDIV. TIMBER CONCESSION (SME)

BORNEO INITIATIVE (DONOR)

SUSTAINABLE TIMBER

FSC CERTIFICATION

INDONESIA

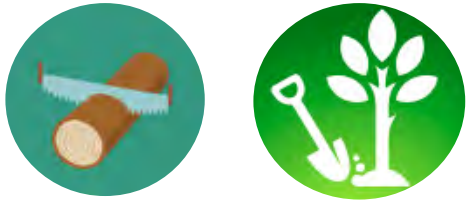
BUSINESS MODEL

- Individual timber concession co-invests, additional to 3-year grant received by Borneo Initiative to obtain sustianable timber FSC certification

- Export market access (timber concession)
- Complete its mission (Borneo Initiative)

CASE # 4
BORNEO INITIATIVE FSC TIMBER

MITIGATION POTENTIAL



ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
FOREST				
Avoided deforestation	Setting aside certain area of land for conservation purpose	42.7	NA	NA
A/R	Reforestation for forest plantation	2.75	1.7	3.8
Sustainable forest management	Management of plantation, e.g. reduced logging waste, reduced damage to remaining trees, soil conservation, reduced fertilizer	1.5	NA	NA

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CASE # 4
BORNEO INITIATIVE FSC TIMBER

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)		
	AVERAGE	LOW	HIGH
FOREST			
Avoided deforestation	42.7	NA	NA
A/R	2.75	1.7	3.8
Sustainable forest management	1.5	NA	NA

AREA (ha)	ER ESTIMATES (tCO2e/yr)
	AVERAGE
169,400	7,233,380
75,920	208,780
700,000	1,050,000
TOTAL	**8,492,160**

ASSUMPTION

- List of mitigation activities based on internet search and assumption that the project follows strictly FSC standards
- SFM is conducted in 50% of total project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation potential of each activity for calculation

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CASE # 4
BORNEO INITIATIVE FSC TIMBER

CO-BENEFIT

CRITERIA	ACTIVITY
Soil quality	• Soil conservation practices, e.g. soil cover vegetation • Erosion control of vulnerable soils and slopes
Water quality	• Protection or restoration of natural water courses, water bodies, and their connectivity • Protection of water catchment
Biodiversity	Protection of natural ecosystem and endangered species

Knowledge brief #5

Forest conservation and/ or restoration via sustainable agricultural production

Forest rehabilitation and sustainable forest management by KFW in Vietnam

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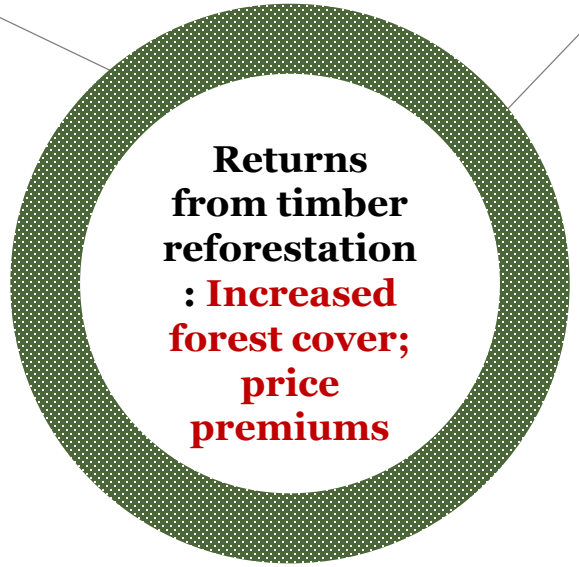
Forest conservation and/ or restoration via sustainable agricultural production: Table of contents

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Description

KFW has provided a grant loan to the Ministry of Agriculture and Rural Development (MARD) to reforest timber plantations over a 10 year period in Central Vietnam

Smallholder farmers want to earn long term benefits through forest replantation

- **Potential solution:** smallholder farmers, who were earlier engaged in deforestation activities, engage in reforestation of timber plantations as an alternate livelihood opportunity to earn long-term benefits during the replantation period (e.g. land use rights, subsidised inputs)
- **Challenge:** reforestation of timber involves the following risks for farmers
  - *Long lead times to develop resources:* long rotation period (5-8 years) could disincentivise farmers from participating in the programme
  - *Alternate livelihood opportunities:* given long lead times in reforestation, farmers require alternate livelihood opportunities during the regrowth period (e.g. inter-cropping, PES through forest patrolling)
  - *Lack of awareness:* farmers may not be aware of the economic benefits of investing in long term timber reforestation



KFW co-invests with the government of Vietnam in sustainable forest management to increase forest cover and improve farmer livelihoods

- **Potential solution:** KFW gave a grant loan of US$9M to Ministry of Agriculture and Rural Development (MARD) (MARD co-invested US$1.2M for in-kind project management) to reforest timber plantations over a 10-year period. While the main objective of the programme was sustainable forest management, local timber firm Thanh Hoa and IKEA entered the project to procure certified timber from these plantations
- **Challenge:** timber replantation requires significant long-term investments and risks of replanting:
  - *Long lead times to secure supply*. longer lead times to secure supply of sustainable timber (5-8 years), requiring long term investments in capacity building and sustainable production[1]
  - *Long pay back period*. requires significant long term upfront investment to develop resources (6-9 years), with a long pay back period to get returns

[1] Tree species of exotic Acacia mangium and auriculiformis were used which have long rotation period of 5-9 years

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Description

While the primary the objective of the programme was to increase forest cover and improve farmer livelihoods in Vietnam, timber processing companies engaged in the later phase to secure sustainable timber supply

1998

- **KFW provided a US$9M grant loan to MARD** to reforest timber plantations
- US$1.2M co-invested by MARD for in-kind project management
- Participatory land use planning prior to actual reforestation activities, combined with award of long-term land use rights and initial subsidies through savings accounts to local communities to disincentivise encroachment for deforestation

2007

- KFW engaged with WWF for training and capacity building of farmers/local communities on replantation of timber plantations

2009

- KFW, with co-funding from SEDCO conducted a pilot study to understand potential benefits of certification of timber plantations
- 1,000Ha certified by the Forest Stewardship Council (FSC) **with support from WWF**
- **Local Vietnamese timber firm Thanh Hoa** partnered with KFW and SEDCO to secure sustainable timber supply from these plantations to access the export markets for timber [1]

2010

- Thanh Hoa was not able to pay high price premiums for certified timber, and withdrew from the project
- IKEA entered to secure supply of sustainable timber at higher prices to access export markets and comply with its global sustainability commitments of securing sustainably produced timber

[1] Project continued to be funded by SEDCO and KFW

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Assessment

The project has direct positive impact on reducing GHG emission through forest rehabilitation, although long lead times to develop resources and high initial investment likely result in low commercial viability

Criteria	Assessment	Scoring

Impact Potential	- **Potential for high GHG emissions reduction** through activities related to afforestation. An **estimated reduction of c.150k tCO2e/year**
	  - Project covered c.48k Ha in Central and north-eastern Vietnam; 1,000Ha certified with support from WWF
	  - *Improved soil quality*: through soil erosion practices and erosion control of vulnerable soils and slopes
	  - *Improved water quality*: protection or restoration of natural water course, water bodies and their connectivity
	  - *Improved biodiversity*: protection of natural eco-system and endangered species
	- **Significant co-benefit through improved farmer income and livelihood**: (i) local communities receive "Green Savings Book" with credit balances; (ii) 32k smallholder farmers obtained long-term land use rights; (iii) opportunity to earn price premiums through sale of certified timber; (iv) 10.6M Ha of reforestation area has been assigned via the Red Book for land use rights with 3.5M Ha to private land owners [1]
		

Economic effectiveness	- **Potential to get price premiums ranging from 15-20%** for FSC certified more than non-certified wood.[2] However, **high costs** to acquire and maintain FSC certification for timber plantations - **Participation of global private sector timber firm such as IKEA as assured off-taker** ensures improved economic effectiveness of the project - **Significant upfront investment** for replantation activities; cost of long-term technical support for farmer training and capacity development over the replantation period - **Long lead times to develop resources** (5-8 years) likely to disincentivise private sector investment in the model, lead to risk of price and demand volatility of timber in the international market, making commercial sustainability a long term play	

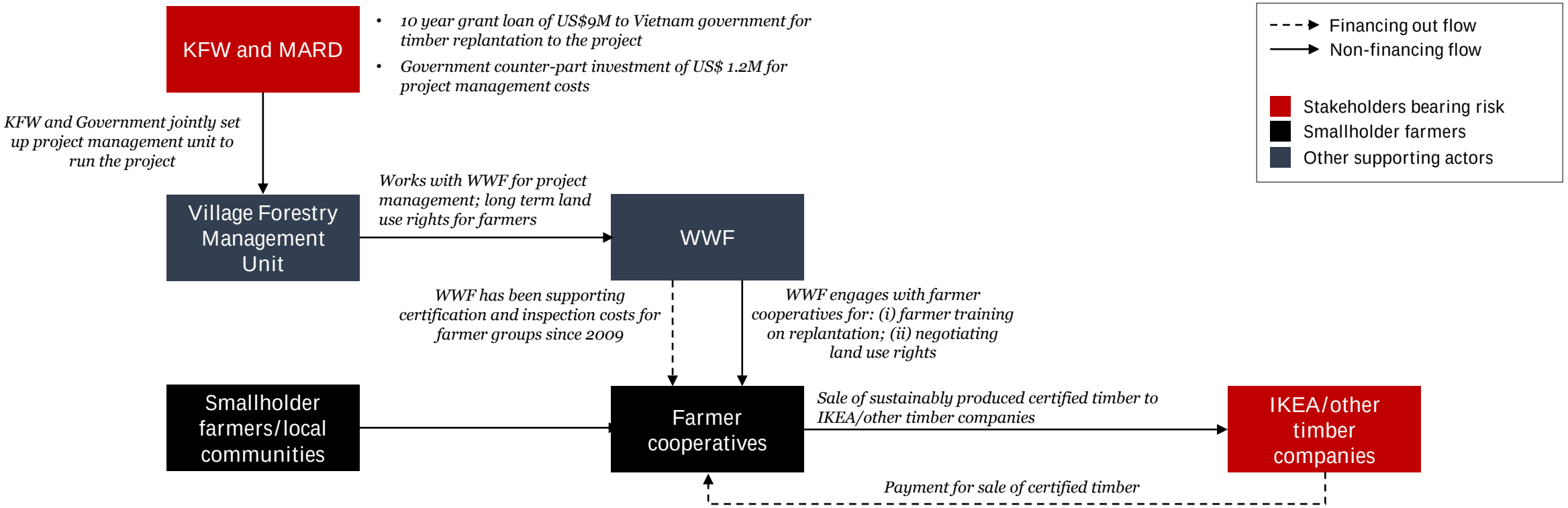
[1] KFW Ex Post Evaluation Brief; Vietnam Forest Programmes II and III
[2] http://vietnam.panda.org/en/newsroom/?uNewsID=255970

The project has low potential for scalability given relatively long term risk of replantation to develop resources; project replication needs to be validated in local context

Criteria	Assessment	Scoring
Innovation and scalability	- **Innovative incentive scheme for local communities:** award of long term land use rights through "Red Book certificates"; and initial subsidies through "Green Savings Book" with credit balances serve as important incentives to create greater project ownership among local communities - **Mainstream model** that has been mostly donor or government funded to encourage sustainable forest management. Long lead times to develop resources may disincentivise private sector to invest in the model to secure sustainably supply of commodities - **Low potential for scalability and replication** – given long term risk of replantation and developing resources; and long term upfront capital investment for replantation. Project replication is contingent on multiple factors such as length of rotation period for commodity re-growth; local contexts, etc.	◑
Other assessment factors	- **Existence of strong partner network:** partnership with MARD as co-investor improves project's ability to access land use rights/permits - **Governance/legal issues** in terms of securing long-term land use rights for local communities; and resolving political and local conflicts that may arise over the project period	◑

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Financial and non financial flows

The model aligns government and donor incentives to increase forest cover, and offers incentives for the private sector to secure sustainable timber supply



[1] Other value chain actors include intermediary processors for collection of timber from farmer cooperatives and input suppliers for supply of technical know-how and inputs to farmers

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Stakeholder drivers and challenges

The underlying driver for KFW was to promote sustainable forest management, however, participation of the private sector to secure sustainable timber supply improves commercial viability

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
KFW Bank aus Verantwortung	**Financing activities** - Provided a US 9M grant loan to MARD for timber replantation for a 10 year period	- **Sustainable forest management:** initial objective of the project was to increase forest over in Vietnam, however, participation of private companies to secure sustainable timber supply enabled the project to get increased returns through certification and access to key export markets	– **Significant long term investment**: significant risk of long term upfront investment in timber replantation (e.g. to provide long term benefits to farmers such as land use rights, savings accounts, subsidised inputs) – **Long lead time to secure supply:** relatively long rotation period for timber replantation (5-8 years), leading to risk of price and demand volatility for product in the export market – **Governance/legal issues:** resolving local communities conflicts over land rights issues over long replantation period	– Partner with NGO for farmer training; dealing with local communities politics and conflicts at project outset – Develop alternate livelihood opportunities for local communities during the re-growth period (e.g. inter-cropping, dairy farming) – Partner with private sector company to sign advance purchase agreement to ensure off-take of commodity when ready for sale during the project design stage

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Stakeholder drivers and challenges

WWF has provided ongoing training and certification support to help smallholders improve their forest management practices to strengthen the business model

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
WWF	**Financing activities** - Support certification and inspection costs [1] **Capacity building** - Technical assistance/ farmer training and capacity development on timber replantation - Work with Vietnam Forest Management Unit to negotiate long-term land rights for communities, and other project management aspects	- **Large scale impact:** opportunity to create impact on increasing forest cover in Vietnam on a larger scale by engaging with large donor like KFW - **Access to strong partner network**: opportunity to connect to large players like IKEA through KFW - **Access to markets:** strengthened access to key export markets through timber certification	– **Certification cost**: high cost to acquire and maintain FSC certification for timber plantations, which may not be justified in the absence of an assured off-taker – **Cost of farmer engagement**: requires long term engagement with local communities and farmers during the replantation period (e.g. to resolve conflicts; land rights issues) – **Misalignment of incentives**: lack of alignment between different stakeholders to provide the eco-system required by smallholders to achieve the desired impact	– Build trust with local communities to ensure greater ownership and long term support for the model – Sign MoU with stakeholders to ensure alignment of incentives – Document and share processes, challenges and learnings with all potential stakeholders to minimise start time – Set up a group certification scheme to reduce administrative and cost burden of the FSC certification process and encourage more companies to participate in the programme – Potential to get funding from the private sector to support the FSC certification process

[1] WWF was supporting certification costs until 2014. We understand that they are now supporting farmers finance the certification costs through other sources (e.g. through low cost bank loans, sale of products)

Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Stakeholder drivers and challenges

Private sector timber firms purchase sustainably produced commodity to meet high demand for certified timber in the global market and earn price premiums for FSC certified wood in the export market

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Ministry of Agriculture and Rural Development (MARD)	**Capacity building** - Works with WWF to provide long term land use rights to local communities; and provide project management support	- **Increase forest cover:** Vietnam's national forestry strategy aims to certify 30% of the country's 4.4M Ha of production forests by 2020 [1]; and promote better forest management practices	– **Significant investment**: long term upfront investment on timber replantation activities – **Long lead times to develop resources**: relatively long rotation period of 5-8 years before commodity is ready for sale/ harvest – **Technical skills**: may not have technical staff/ skills to train farmers on product certification	– Build trust with local communities to ensure greater ownership of the project and resolve local conflicts – Engage closely with NGO/farmer aggregator with appropriate skills on farmer training and capacity development
Thanh Hoa	**Connect to markets** - Purchases sustainably produced certified timber from smallholder farmers	- **Demand for timber**: meet demand for high quality FSC certified wood for the global markets - **Price premiums:** potential to get price premiums of **15-20%** for FSC certified wood	– **Secured supply**: farmers may sell certified timber to other buyers in absence of MoU – **Long lead times to develop resources**: risk of price and demand volatility of timber in the international market, given long lead times to develop resources	– Sign advance purchase agreement with farmers to get assured timber supply – Support part of the certification cost for farmers to increase area under certification

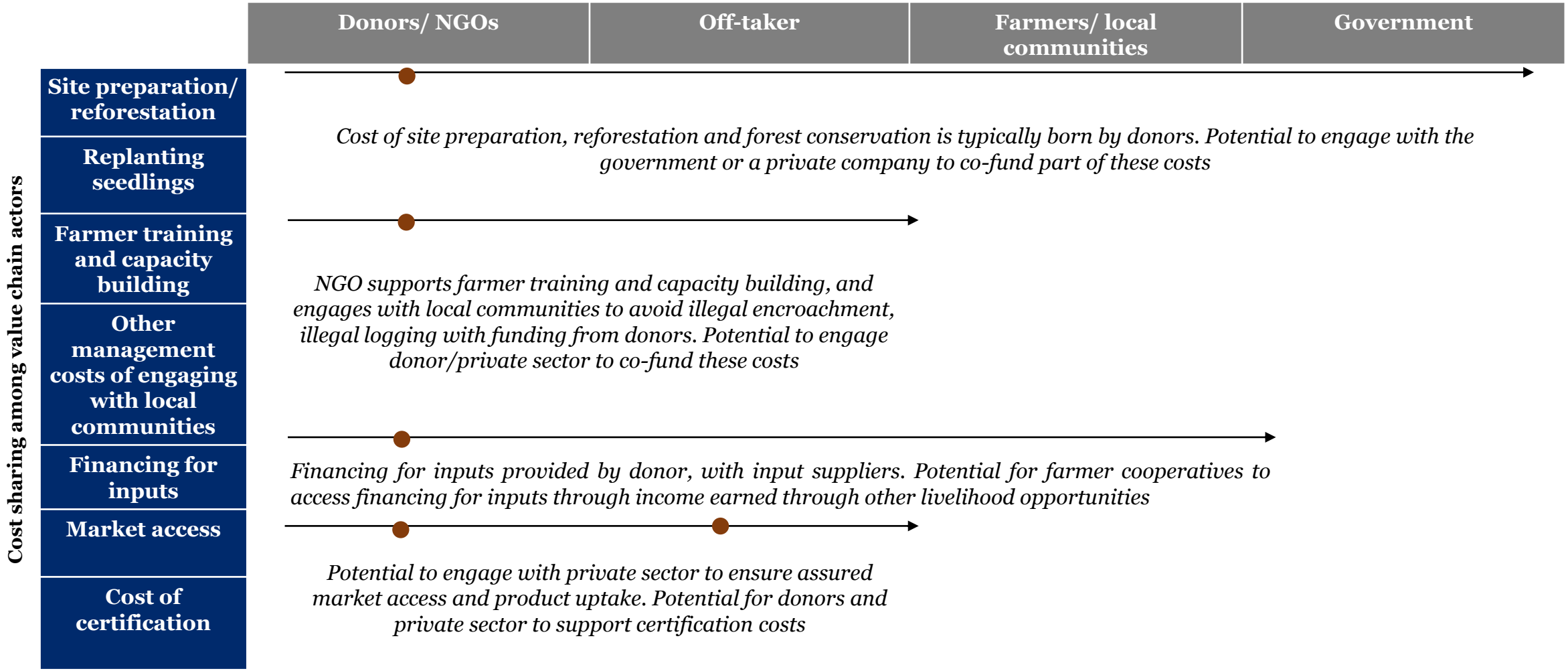
1 http://wwf.panda.org/wwf_news/?255415/Further-certification-success-for-Vietnams-Quang-Tri-smallholders

Smallholder farmers benefit from long term benefits from timber replantation, but may need alternate livelihood opportunities during the re-growth period

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
IKEA	**Connect to markets** - Purchases sustainably produced certified timber from smallholder farmers	- **Meet sustainability targets**: reinforce brand reputation to meet global targets to source sustainably produced timber - **Improved access to export markets**: FSC certification improves access to export markets for timber	– **Secure supply**: farmers may sell timber to other buyers in absence of MoU – **Long lead times to develop resources**: long rotation period (5-8 years) before products is ready for sale. This also has implications of the price and demand volatility of timber in the market	– Sign long term advance purchase agreement with smallholders to get assured supply of timber – Potential to support part of the certification cost in return for a guarantee for assured timber supply
Farmers/ local communities	**Capacity building** - Reforestation of timber plantations and preserving the forest area	– **Long term benefits:** award of long term land use rights through "Red Book"; "Green Savings Book" for savings account – **Subsidised inputs:** performance related subsidies in the start-up phase through periodic payments from savings accounts	– **Long rotation period**: long lead times of replantation may disincentivise farmers to engage in long term replantation – **Lack of awareness:** farmers may not be aware of long-term economic benefits of timber replantation	– Enter into advance purchase agreement with buyers to ensure guaranteed uptake – Engage in alternate livelihood opportunities to sustain income during the re-growth period

Forest conservation and/ or restoration via sustainable agricultural production: Cost sharing burden

While initial donor funding for replantation is necessary, costs of long term capacity building and sustainable commodity production can be financed by the private sector



Case study: Forest rehabilitation and sustainable forest management by KFW in Vietnam: Potential support

Donors and multilaterals can provide long term grant funding to support high upfront cost of timber replantation to catalyse private sector investments in the programme

Role 1: Long term grant funding for forest restoration activities	Role 2: Grant funding for capacity building and technical assistance	Role 3: Support to connect smallholders to off-takers
- Grant funding for **initial investment of reforestation to assume upfront risks of long term landscape conversion**, with long term capacity building and sustainable production taken over by the private sector - **May not directly leverage** as much private sector investment in the initial years (until the product is nearly ready for harvest/sale)	- **Grant funding for farmer capacity development** on replantation/restoration for the implementing NGO (or other stakeholders) to reduce burden of high farmer transaction costs	- **Connect smallholder farmers to assured off-takers for sale of sustainably produced timber** at the project outset is likely to create greater incentives for farmers to participate in the programme

Annexure

CASE#5 KFW TIMBER

DONOR **NGO** **SUSTAINABLE TIMBER** **FSC CERTIFICATION** **VIETNAM**

BUSINESS MODEL

- KFW provided grant for reforestation (plantation) and WWF provided grant/TA for FSC certification in a portion of the area and link the farmers to potential buyer, e.g. IKEA

- Donor/NGO's mission for environmental protection

CASE#5 KFW TIMBER

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
Avoided deforestation	Land set aside for conservation purpose	42.7	NA	NA
A/R	Reforestation for forest plantation	2.75	1.7	3.8
Sustainable forest management	Management of plantation, e.g. reduced logging waste, reduced damage to remaining trees, soil conservation, reduced fertiliser, set-aside	1.5	NA	NA

CASE#5 KFW TIMBER

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)		
	AVERAGE	LOW	HIGH
Avoided deforestation	42.7	NA	NA
A/R	2.75	1.7	3.8
Sustainable forest management	1.5	NA	NA

AREA	ER ESTIMATES (tCO2e/yr)
	AVERAGE
4,800	60,960
19,200	52,800
24,000	36,000
TOTAL	149,760

ASSUMPTION

- List of mitigation activities based on internet search and assumption that the project follows strictly FSC standards
- Proportion of land dedicated for Avoided deforestation, A/R, and SFM is 10:40:50
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

CASE#5
KFW TIMBER

CO-BENEFIT

	CRITERIA	ACTIVITY
	Soil quality	• Soil conservation practices, e.g. soil cover vegetation • Erosion control of vulnerable soils and slopes
	Water quality	• Protection or restoration of natural water courses, water bodies, and their connectivity • Protection of water catchment
	Biodiversity	Protection of natural ecosystem and endangered species

Knowledge brief #6

Forest conservation and/ or restoration via sustainable agricultural production

Procurement of certified shrimp through mangroves restoration by Minh Phu in Vietnam

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Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu in Vietnam: Table of contents

Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu in Vietnam: Description

The Mangroves and Markets project is an initiative for mangrove restoration and promotion of improved organic shrimp certification in the coastal areas of Ca Mau province, Vietnam

Smallholder farmers want to earn price premiums through sale of certified shrimp to Minh Phu

- **Potential solution:** farmers earn price premiums through sale of certified shrimp and an additional payment linked to increasing mangrove cover in the province. Farmers can also strengthen their access to mainstream shrimp export markets through Minh Phu's network
- **Challenge:**
  - *Compliance with certification standards*. farmers need extensive training and technical support to grow organic shrimp complying with Minh Phu's certification requirements for the export market
  - *Credible or assured off-taker*. farmers may not get assured returns for growing certified shrimp in the absence of guaranteed off-take from Minh Phu

Minh Phu wants to engage in mangrove reforestation to grow certified shrimp for export markets

Intensive shrimp farming in Ca Mau province has damaged natural mangrove forests cleared to accommodate shrimp ponds

- **Potential solution:** Minh Phu invests in integrated mangrove-shrimp aquaculture to integrate shrimp farms into mangrove ecosystems to promote ecologically-sound certified shrimp production. Minh Phu has committed to buy all the certified shrimp from farmers for export to the US, EU and Japan markets
- **Challenges:**
  - *High certification costs*. cost to acquire and maintain multiple certification for various markets
  - *Volatile export market*. price and demand volatility for certified shrimp in the export market
  - *Strong competition* from other shrimp exporters may make the model less commercially feasible
  - *Technical assistance to farmers*: lack of capacity to provide technical support to smallholder farmers to grow certified shrimp

Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu in Vietnam: Assessment

The project has high potential to reduce GHG emissions through mangrove restoration through carbon sequestration, and to generate profits in the short term

Criteria	Assessment	Scoring[1]

Impact Potential	- **Considerable potential to reduce GHG emissions:** 80Ha of mangrove forests replanted; 2,700Ha of land certified and mangrove cover increased from 39% to 44% during 2013-15. An **estimated reduction of C.40k tCO2e/year.** Co-benefits:
	  - *Improved soil quality*: dense roots of mangroves conserved binds soil; and above ground roots reduce soil erosion
	  - *Improved water quality*: through prohibition of chemicals; forest management and generation reduces erosion potential
	  - *Improved biodiversity*: protection of adjacent ecosystems and mangrove restoration to meet 50% mangrove cover
	- **Significant co-benefits for farmers**
	  - **Farmers get 10% price premium** for organic shrimp of any size (comprising payment for certified shrimp of US$ 0.13/kg and PES payment of US$ 22/Ha/ year) linked to mangrove area replanted
	  - **Improves income**: net income from selected farms in 2013 increased **1.5 times (from 60-70VND/ year to 150-200 VND/ year)** [2]
	  - **2k farmer HH trained on organic shrimp certification** over 2013-15, 800 shrimp farm households obtained Naturaland certification; 1,500 are in the process of getting certified
		

Economic effectiveness	- **Potential to earn large export earnings**, given high demand for certified shrimp in the EU and US markets, however: (i) strong competition for certified shrimp in the export market; and (ii) **difficult to pass on extra cost of certification to buyers in the export market** [3] - **High costs to acquire and maintain shrimp certification**: c.US$15k for annual certification for 800 farmers. Also involves recurrent costs of maintaining internal control system to monitor compliance with certification standards for different export markets - **Potential for model to become self-sustainable** in the short term, with some initial donor funding. However, access to stable and profitable international markets is important to ensure long term sustainability	

[1] Our scoring of the assessment criteria is based on Dalberg analysis; stakeholder consultations during the field visits; and inputs from working group participants at the workshop in Bangkok

[2] https://www.newglobalcitizen.com/impact-and-innovation/snv-integrates-shrimp-aquaculture-mangrove-protection-ca-mau-vietnam

[3] In 2015, Minh Phu's revenues dropped due to stiff international competition. They developed their own brand called "Mangrove shrimp" to promote sales in Japan. The brand borrows from the Naturaland standard but is less strict when it comes to following certain compliances rules

Scaling up the model to other shrimp producers and smallholders will require upfront support for shrimp certification; farmer training and access to profitable export markets

Criteria	Assessment	Scoring

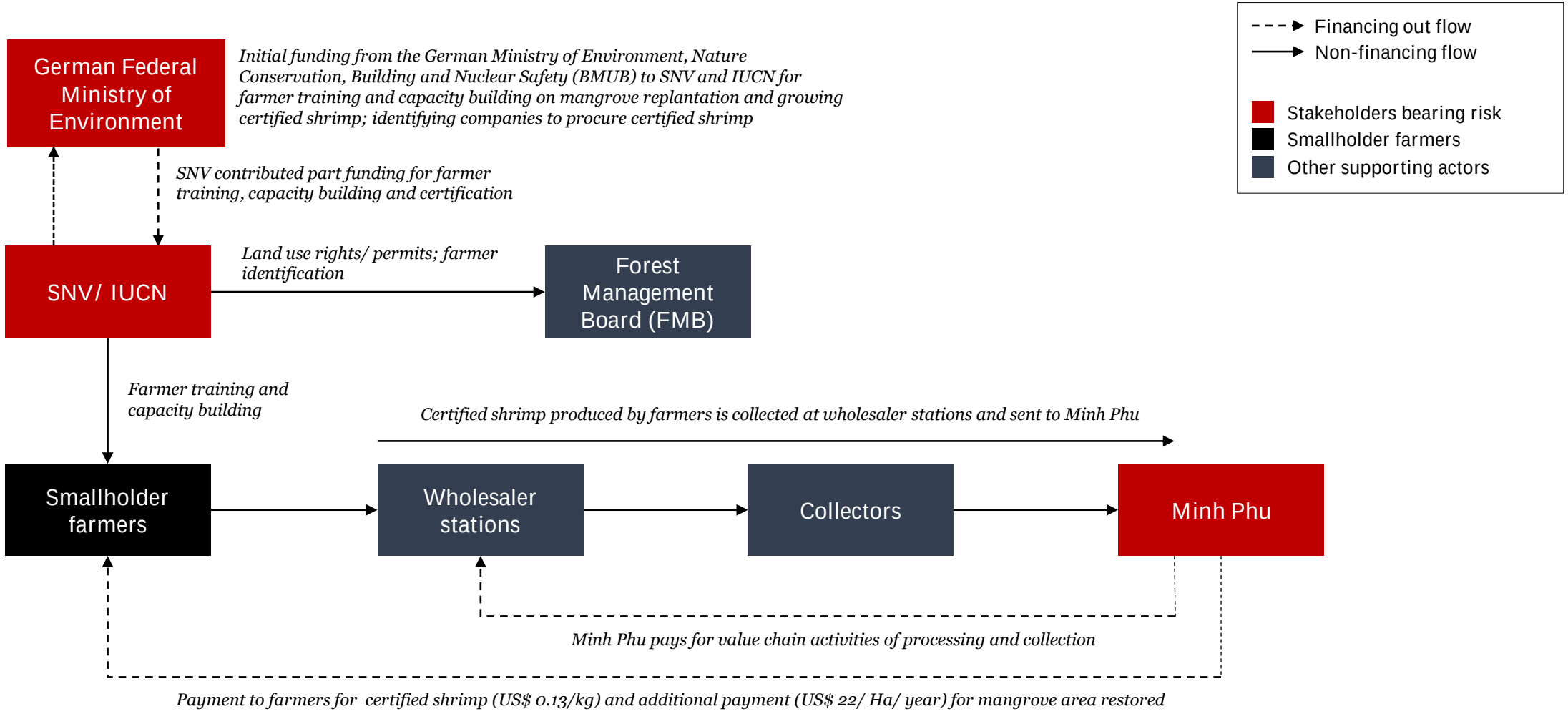
Innovation and scalability	- **Considerable potential to scale up the model to include other shrimp processors and smallholders**
	  - Pilot phases of the model may be successful for large companies like Minh Phu, who have the resources and access to export markets in the US and EU
	  - However, scaling up the model to other domestic shrimp producers and smallholder farmers requires significant investment to support certification costs; farmer training and capacity building; and access to export markets
	  - Potential opportunity to combine the model with other revenue stream (e.g. PES) to improve scalability and feasibility
	- **Innovative pilot to support legal basis for aquaculture PES establishment** through an additional payment to farmers for mangrove area reforested and the possibility of accessing carbon finance through switching to higher shrimp production standards and rehabilitation of mangrove forests[1]
		

Other assessment factors	- **Strong partner network**: Participation of Minh Phu as assured buyer of certified shrimp lends credibility to the project. SNV and IUCN are large implementation NGOs, with the resources, capacity and network to secure land use rights/ permits from the government. - **Government support for long term land tenure arrangements** (e.g. for land certification) is a key enabling condition for programme success - Project uses a **participatory decision making process ensuring alignment** of incentives for all stakeholders across the value chain	

[1] The payment of PES to farmers in this case is made voluntarily by Minh Phu to farmers and is not required to pass through a government controlled fund.. PES payment is not necessarily given for mangrove replantation, but to motivate farmers to switch to following improved practices to grow organic certified shrimp, and for them to participate in the certification scheme

Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu: Financial & non-financial flows

The project was initially funded by the German Federal Ministry of Environment to increase mangrove cover in Vietnam, and Minh Phu was brought as an assured buyer of certified shrimp



Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu : Stakeholder drivers & challenges

Minh Phu procures certified shrimp to access export markets, however, high costs to acquire and maintain annual certification is a key challenge to scale up this model

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
MINH PHU	**Financing activities** - Finances costs of shrimp collection; certification; farmer training and capacity building **Connect to markets** - Creates a direct link between shrimp farmers and export markets in the EU, US and Japan	– **Access key export markets:** Minh Phu can access key export markets in the EU and US which require strict certification standards for shrimp imports	– **High certification costs**: cost of annual certification; third party audits; internal control systems to monitor compliance with certification standards [1] – **Cost of monitoring farmer compliance**: E.g. Minh Phu has 7 people in the field to monitor farmer compliance with certification standards – **Competition** from other shrimp exporters – **Technical assistance for farmers:** Minh Phu does not have technical expertise for farmer training on certification – **Strict certification requirements:** Naturalnd has very strict compliance rules, which increases the risk of the product being rejected	– Potential to get initial de-risking capital from donors for upfront costs of certification and setting up internal control system to monitor compliance as the programme expands to Phase II – Advance purchase agreement to buy certified shrimp from farmers for assured shrimp supply for export – Participate in group certification process (with other similar companies) to reduce cost of farmer training and certification

[1] Naturaland has been selected as the certification scheme which is a strict certification scheme which requires 50% mangrove cover on shrimp farms; mandate regular third party audits, etc.

SNC, IUCN and Forest Management Board can increase mangrove cover in Vietnam and create impact on a larger scale through Minh Phu's network

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
SNV IUCN	**Capacity building** - Works with FMB for farmer selection and aggregation - Train farmers to breeding certified shrimp; replant mangrove forests; monitor farmer compliances; train companies to meet certification requirements	– **Large scale impact**: opportunity to create impact on a larger scale by partnering with Minh Phu – **Strengthened access to export** market for certified shrimp through Minh Phu's network	– **Lack of funding** to provide ongoing TA and training support to farmers – **Need to start with a pilot** each time they wish to replicate in a new province or with different partners due to local conditions	– Leverage donor or private sector funding for farmer training and capacity building costs – Document and share processes, challenges and learnings with all potential stakeholders to minimise start time
Forest Management Board (FMB)	**Capacity building** - Identify and form farmer cooperatives - Monitor mangrove replantation - Facilitates land rights/ permits for farmers	– **Increase mangrove cover:** FMB has a mandate to increase mangrove cover in Vietnam and reduce deforestation in the province	– **High costs of farmer identification and monitoring**: requires considerable time and resources for farmer identification; forming farmer cooperatives, monitoring farmer replantation [1]	– Partner with NGO/donor to engage with farmers on replantation

[1] SNV works with FMB to identify farmers interested in participating in the project in the province through a GIS mapping system, followed by surveys to gauge farmer interest

Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu : Stakeholder drivers & challenges

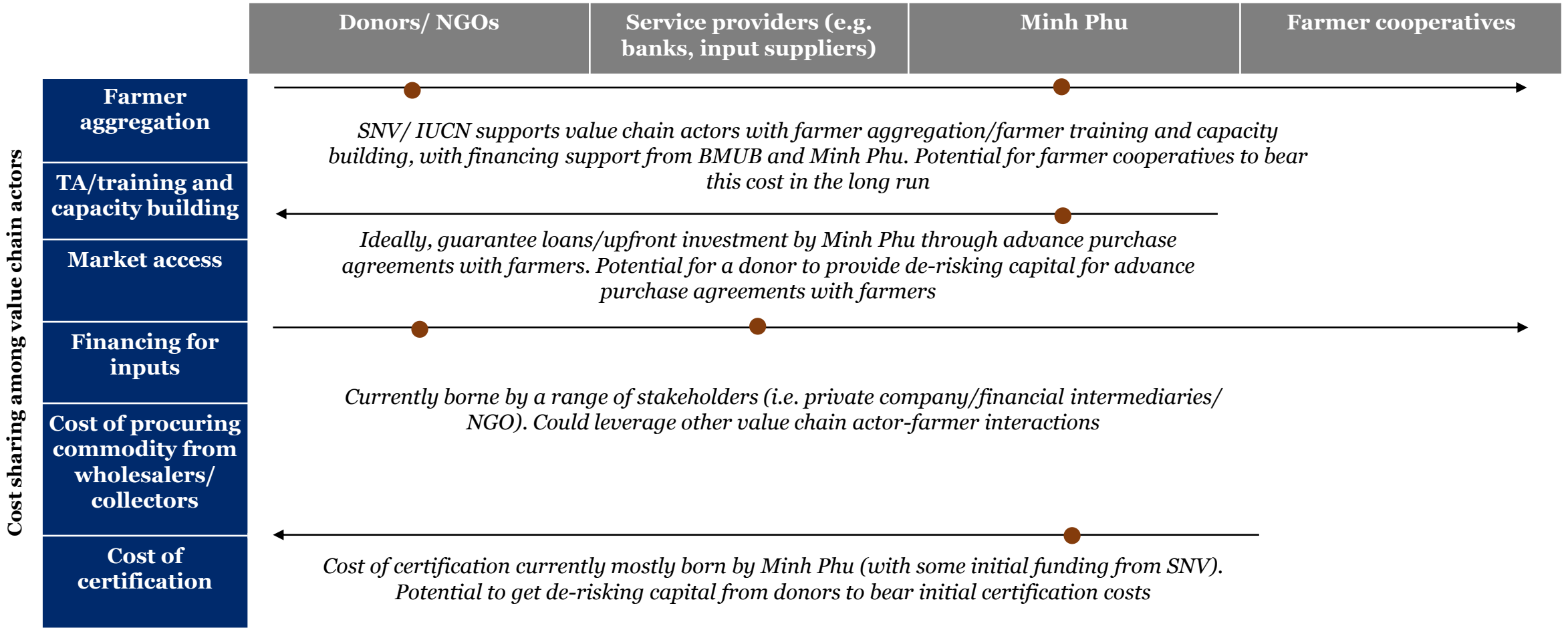
Farmers can earn price premium through sale of certified shrimp to Minh Phu, and get secured access to mainstream shrimp export markets

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Farmer cooperatives***	**Capacity building** – Sign contract with FMB to increase mangrove cover through restoration/ replantation – Breeding and marketing certified shrimp	– **Improved farmer income:** price premiums of 10% for shrimp of any size (through price premiums for certified shrimp and additional PES payment for mangrove area replanted). **1.5 times** increase in income in comparison with traditional shrimp aquaculture [1] – **Secured access** to export markets in the EU and US – **Improved skills:** capacity development on breeding certified shrimp and improved environmental awareness	– **Compliance with certification standards:** requires considerable training and capacity development to follow sustainable practices to meet Minh Phu's certification requirements for different export markets – **Assured off-taker**: Risk of not getting assured returns/ income in the absence of advance purchase agreement with Minh Phu	– Enter into Advance purchase agreement with Minh Phu/ other buyers for assured off-take of certified shrimp – Improve technical skills in breeding and marketing certified shrimp by engaging closely with SNV and IUCN

[1] https://www.newglobalcitizen.com/impact-and-innovation/snv-integrates-shrimp-aquaculture-mangrove-protection-ca-mau-vietnam;

Sustainable agricultural production to secure procurement and access key export markets: Cost sharing burden

While initial donor funding is required to share these costs, the cost bearing responsibility should eventually move to the private sector for the model to be financially self-sustainable in the long term



Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu : Potential support

We came up with three potential options through which donors and multilaterals could catalyse private sector investments in this programme

Grant funding for farmer training and capacity development

- SNV and IUCN received US$ 1.6M from the German Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BMUB) to identify companies interested to procure certified shrimp through the programme; farmer training and capacity building and local community awareness for 2012-16 (3.5 years)

✓ Minh Phu is financing most value chain activities related to shrimp production and certification (with some support from SNV)

✓ Potential to get funding from donors to support Minh Phu's costs of farmer training, as they expand to Phase II to cover 3,400 additional farmers

De-risking capital to support shrimp certification costs

- High annual costs of shrimp certification (c.US$15k for 800 farmers) are currently paid by Minh Phu to secure access to export market in EU, US and Japan
- Naturaland has been selected as a suitable certification scheme because of its strict rules which prohibit conversion of primary forests; require 50% mangrove cover and mandate regular third party audits

✓ Minh Phu currently pays for the entire certification process (with some initial support from SNV)

✓ Potential for de-risking capital from donors to support initial certification costs for Minh Phu and other companies participating in Phase II of the project

Initial de-risking capital to scale up Phase II of the project

- Phase II of the programme is targeting to include 22 additional medium- large scale companies to procure certified shrimp produced by farmers

✓ Potential for donors to support Phase II to access medium-large companies to participate in the programme

✓ Provide initial de-risking capital to set up a platform for training on group certification to enable smaller companies to participate in the programme

Case study: Procurement of certified shrimp through mangroves restoration by Minh Phu : Potential support

....however following the workshop group discussion, these options were refined to fit into four large buckets of donors/multilateral support to catalyse private sector investments in the programme

Potential role for donors/multilaterals

Capacity building and technical assistance

- **Capacity building support** to smallholder farmers by partner NGO (or other stakeholders). For example, costs of farmer aggregation; farmer capacity development to breed and grow organic certified shrimp; monitoring farmer compliance to follow certification standards for different export markets. Technical support can also be provided for farmer identification through GIS mapping and land use planning arrangements

Financial interventions

- **Initial de-risking capital** or loan guarantees to:
  - **Support high initial costs** to acquire certification for different export markets; set up systems for internal quality control compliance, etc.
  - **expand the programme to include additional shrimp companies**. As the programme expands to include 22 additional companies, donors could provide loan guarantees to set up a group certification and training platform for smaller companies to participate in the programme. This is likely to reduce high certification costs for these companies through economies of scale [2]

Convening platform

- **Set up a roundtable for shrimp** (similar to other commodities like coffee in Indonesia) to create greater awareness of the model and garner greater stakeholder support and collaboration to engage in Phase II of the programme
- **Connect smallholder farmers with other shrimp processors** to scale up Phase II and ensure continued farmer engagement in the programme

Impact monitoring and evaluation

- **Support monitoring, reporting and certification (MRV) safeguards** and impact assessment of the programme (e.g., impact of mangrove restoration on emissions reduction, farmer compliance with achieving 50% mangrove cover, impact of the pilot PES for aquaculture scheme on farmer incomes) to generate learnings for project scalability and replication

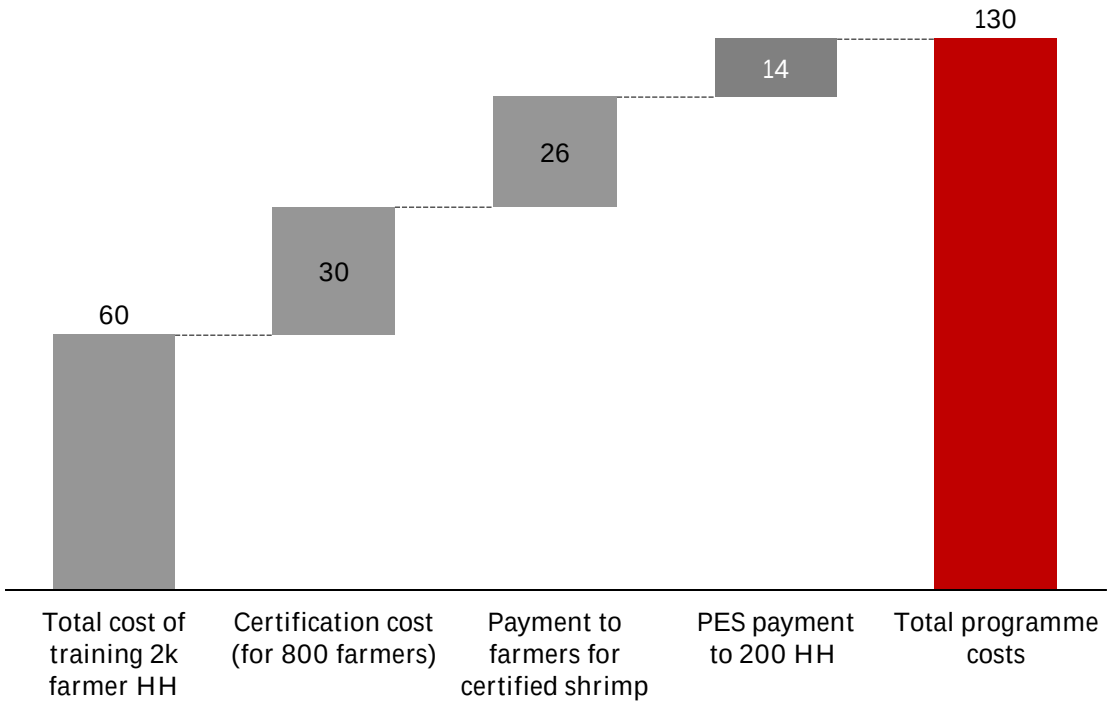
[1] Options for potential support have been developed through Dalberg analysis; stakeholder consultations; and inputs from working group participants during a USAID/RDMA-organised event in Bangkok on 26 September 2016

[2] There is also potential to combine shrimp certification with certification of other commodities in the province (e.g. fish)

The model has potential to generate profits in 1-2 years, given high demand for organic certified shrimp in the export market

Costs of Minh Phu's mangroves and markets programme

US$ '000s (2013-15)[1]



Although costs for shrimp certification and farmer training for Minh Phu are high…

- High costs of certification and farmer training: Minh Phu pays c.US$15k/ year (for 800 farmers). Additional costs to monitor internal compliance, annual audits for certification; farmer capacity development. Difficult for Minh Phu to pass on certification costs to buyers in export markets
- Lack data on revenues to justify investments in the project: there is insufficient revenue data to prove commercial feasibility of the project

…there is high potential for Minh Phu to achieve commercial sustainability within 2 years, through large export revenues

- Established access to markets: Minh Phu is a large seafood processor, with established access to export markets. High potential to earn large export revenues from EU and US markets through shrimp certification
- *Reduced programme costs:* farmer training costs for breeding and marketing certified organic shrimp likely to decline over the years with improved farmer awareness and technical skills
- *Potential to share certification costs:* potential for Minh Phu to share certification costs with other companies participating in the programme through group certification and training process

[1] Source: Results from Yearly report, Results to date (2013-15). Part of the training and certification costs were also paid by SNV (although significant proportion is borne by Minh Phu)

Additional analysis of the commercial sustainability and impact assessment of the programme is key to inform lessons for future scalability and replication

Key outstanding questions for further analysis[1]

Detailed commercial feasibility analysis	- Further analysis of the financial model (e.g., detailed breakdown of programme costs and revenues; project IRR) to understand commercial viability for Minh Phu in the long run (e.g. whether price premiums and PES payments are sustainable in the long run) - Explore potential for other financial intermediaries such as banks, venture capital funds, MFIs to support high costs of initial certification and farmer capacity development for private sector companies - Explore potential to combine model with other revenue streams (e.g. carbons offsets) to improve commercial viability
Concrete evidence on impact	- Quantitative assessment of impact of mangrove restoration and shrimp aquaculture on reducing GHG emissions to understand commercial feasibility vis-à-vis impact achieved - Evidence on impact/progress achieved under the PES aquaculture pilot to understand commercial viability of the scheme, and generate lessons for the PES for aquaculture policy in Vietnam
Deeper understanding of project risks and mitigating strategies to scale up the model	- In-depth understanding of project risks for medium-small scale shrimp processors to participate in Phase II of the programme - For example, Minh Phu has the resources and market access to bear high certification costs. However, smaller shrimp processors may be less willing to participate in the programme, given high certification and training costs. Setting up a group certification and training platform is likely to generate economies of scale for these companies to participate in the programme

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016

Annexure

CASE # 4
MINH PHU SHRIMP-MANGROVE

NGO | **LARGE DOMESTIC EXPORTER** | **ORGANIC SHRIMP** | **NATURLAND CERTIFICATION** | **VIETNAM**

BUSINESS MODEL

- Min Phu pays aquaculture PES to Naturland certified organic shrimp SHFs (mangrove conservation as required activities), and procures organic shrimps.
- Reduce corporate carbon footprint + improve sustainability of operations by providing additional incentives and benefits to farmers + export market price premium (Minh Phu objective)
- Mangrove conservation (SNV objective)

USAID FROM THE AMERICAN PEOPLE Dalberg

CASE # 4
MINH PHU SHRIMP-MANGROVE

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
AD	• 50% of mangrove cover in each farm is required • Forbid removal or damage to mangrove forest for shrimp pond expansion	42.7	NA	NA
A/R	Mangrove reforestation in degraded area	2.75	1.7	3.8
Wetland restoration	Restore abandoned shrimp ponds and farm area artificially with planted mangroves	70.8	7.33	124.31

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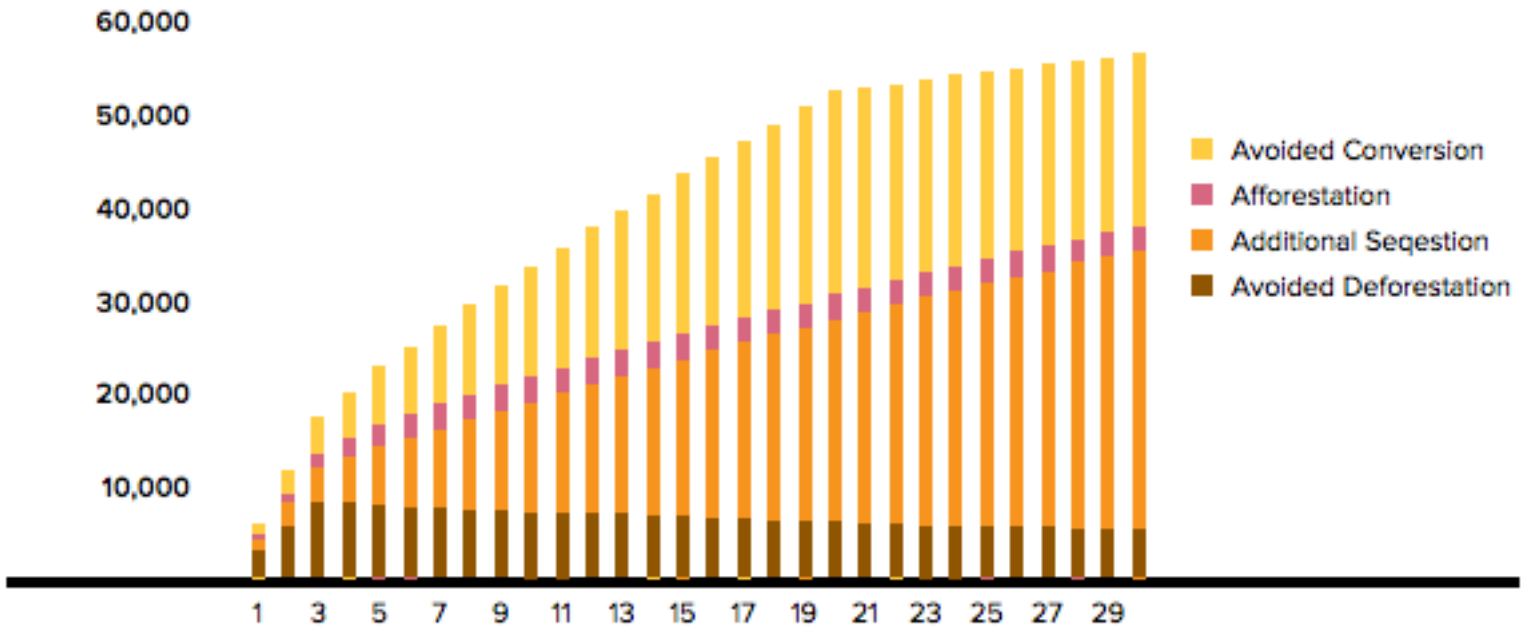
CASE # 4
MINH PHU SHRIMP-MANGROVE

Estimated reduction in GHG emissions due to the Mangrove and Market project over 30 years (tCO2e)



Source: SNV (2014)

CASE # 4
MINH PHU SHRIMP-MANGROVE

Estimated total potential reduction in GHG emissions by the MAM project over 30 years

Avoided emissions or removal	Activity	tCO_2e
Baseline - GHG emissions	Clearing mangroves - release of carbon in AGB	176,214
	Conversion to aquaculture - release of soil carbon	423,147
Project - GHG removal	Sequestration by conserved mangroves	483,300
	Sequestration by additional planted mangroves	71,586
TOTAL		**1,154,246**

Source: SNV (2014)

CASE # 4
MINH PHU SHRIMP-MANGROVE

CO-BENEFIT

CRITERIA	ACTIVITY
Soil quality	• Dense roots of mangroves conserved and reforested help to bind and build soils • Above-ground roots reduce soil erosion
Water quality	• Prohibition of chemicals and use of natural remedies and treatment in case of disease, hence reducing potential agrichemical contamination • Forest management and regeneration could reduce erosion potential and subsequent sedimentation of water bodies
Biodiversity	• Protection of adjacent ecosystems • Mangrove reforestation to meet 50% mangrove cover requirement

Knowledge brief #7

Forest conservation and/ or restoration via sustainable agricultural production

"Wildlife Friendly IBIS rice" project by World Conservation Society (WCS) in Cambodia

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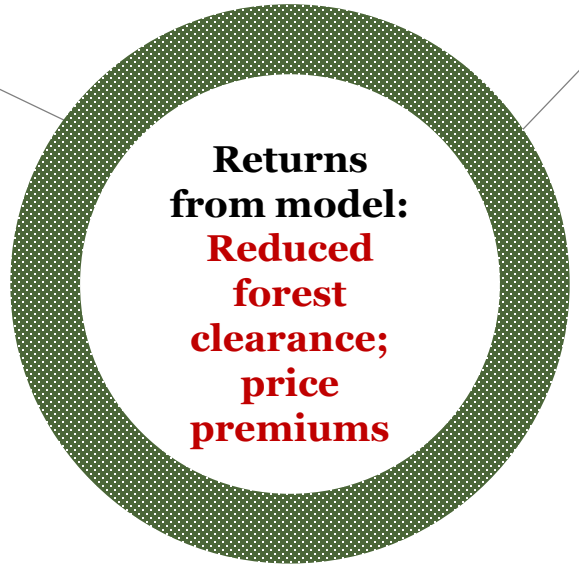
Case study: “Wildlife Friendly IBIS rice” project by WCS in Cambodia : Table of contents

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Description

The "Wildlife friendly" IBIS rice project run by WCS incentivises protected area local communities to grow organic rice, as a way to reduce dependence on logging and hunting

Local communities want to earn increased income through alternate livelihood opportunities of earning price premiums for organic rice

- **Potential solution:** local communities in protected areas who were earlier engaging in widespread forest clearance (given limited access to markets to sell their product) can earn price premiums by growing "wildlife friendly" organic rice subject to abiding conservation agreements and get improved access to markets for organic rice in Cambodia
- **Challenge:**
  - *Technical support:* considerable training support is required on system of rice intensification (SRI), use of non-organic fertilisers; compliance with international standards for certification
  - *Credible off-taker and market:* organic rice is a niche product with limited demand in Cambodia (e.g. mostly niche high end customers, hotels and restaurants), which may disincentivise farmers to engage in organic rice farming



WCS wants to reduce forest clearance in protected areas by offering farmers alternate livelihood opportunities

- **Potential solution:** WCS want to provide local communities an incentive to engage in conservation and reduce deforestation by offering farmers premium for organic rice if they agree to abide "no encroachment" agreements that delineate area farmers can clear for growing rice and "no hunting agreements" to protect giant IBIS and other species at threat from agriculture concessions
- **Challenges:**
  - *Technical support:* provide intensive training for farmers to grow organic rice, ensure compliance with certification standards
  - *Niche market.* limited market demand for organic rice (e.g. high end customers, hotels), making commercial feasibility a long term play
  - *High cost of certification:* high cost to acquire and maintain certification to access the EU and US markets for export

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Assessment

Although project has high potential to earn price premiums, commercial viability has been a long term play given niche market and limited demand for organic rice in Cambodia

Criteria	Assessment	Scoring

Impact Potential	- **Mitigation benefits mostly from deforestation.** project covers 35k Ha (10k HH in 13 villages). **estimated reduction of c.45k tCO2e/year. Other benefits:**
	  - *Improved soil quality:* use of organic amendments maintains soil structure and increases its nutrition holding capacity; alternate drying reduces potential soil quality and carbon disturbance
	  - *Improved water quality*: lower risk of water contamination due to reduced use of agrochemicals and alternate drying
	  - *Improved biodiversity*: due to "no hunting" agreements; alternate drying preserves natural wildlife habitat
	- **Significant co-benefits for local communities**
	  - **Increased income through price premiums for organic/certified rice:** farmer income increased from US$8k to US$40k (by 38%) over 2008-14 [1] Farmers receive a **price premium of 50%** for organic rice. Potential to get **another 20%** premium with rice certification[2]
	  - **Improved access to new markets** for organic rice for farmers; and improved technical skills to grow organic rice
		

Economic effectiveness	- **High price premiums for organic rice:** organic rice sold at a premium of c.200% on the shelf in the domestic market [3] - **However, niche domestic market for organic rice limits rice revenues:** demand for organic rice in Cambodia is limited to niche high end customers, upmarket hotels and restaurants, etc., limiting quantum of rice revenues earned - **Project has been fully donor funded until now, with accumulated losses:** US$75k on a turnover of US$220k for FY 2015, mostly due to high costs of monitoring and low milling yields. Now moving towards steady sales of US$20k/ month - **However, the project is now using a more business oriented approach** to increase rice revenues through: (i) product diversification to increase sales volume in the domestic market; (ii) accessing export markets through rice certification (potential to charge a 60% price premium for certified rice)[4]; (iii) milling yield improvements to reduce cost of production [5]	

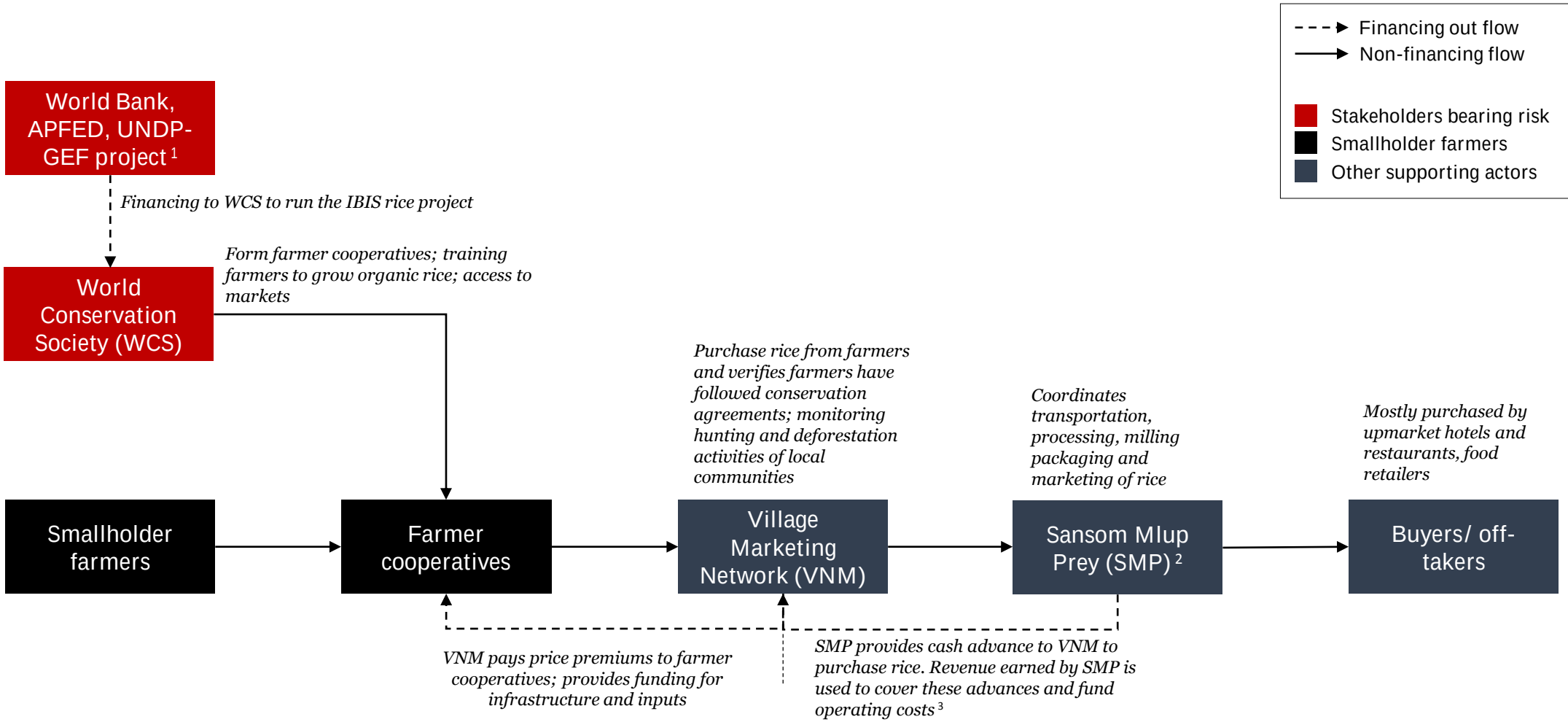
[1] WCS IBSI rice presentation
[2] Farmers get a premium of US$0.03/ kg more than other local buyers
[3] IBIS rice is sold at US$2.5/kg, whereas normal rice is sold at US$0.77/kg in Cambodia
[4] WCS IBSI rice presentation; WCS has recently achieve EU and US certification to access export markets
[5] Achieving 40% Head Rice Yield (HRY) reduces cost of goods sold from US$0.84 to US$0.7/ kg

High potential for scalability through product diversification and supporting access to export markets in the near term; programme can be replicated to rice growing communities in other protected areas

Criteria	Assessment	Scoring
Innovation and scalability	- **Mature model, with high potential for scalability**. high potential to scale-up the model to target a larger customer base through: (i) product diversification for domestic and export markets (e.g. rice crackers); and (ii) access to EU and US export markets through rice certification - **High potential for replicability**. given that a majority of rural communities in Cambodia are engaged in rice farming, the model can be easily replicated to incentivise these communities to grow high value jasmine rice to earn price premiums	
Other assessment factors	- **Strong partner network**. WCS is a large international conservation organisation, with the resources; capacity and network to implement large scale model effectively - **Participatory approach with farmers to develop land use plan on "**no hunting", "no encroachment" agreements ensures strong community engagement in the model. Additionally, model was well accepted by local communities, since they were previously also engaged in growing jasmine rice in the area, but lacked access to markets and were engaged in large scale deforestation	

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Financial and non-financial flows

The programme uses a multi-stakeholder approach to create an effective link between economic development of local communities and environmental conservation



[1] The project is funded by a two year World Bank Development Marketplace grant, a one year APFED grant and part of the UNDP-GEF CALM project.
[2] SMP is an NGO that organises collection of rice from each village and delivers it to a mill for processing. The rice is then packaged and labelled as Wildlife Friendly TM and delivered to outlets that have been contracted to sell the rice
[3] Surplus revenue earned by SMP is returned to VNMs to be divided among farmers participating in the scheme

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Stakeholder drivers and challenges

Initiated by WCS, the programme provides training and procures deforestation-free organic and wildlife friendly rice from participating farmers in the protected area through village cooperatives

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
WCS	**Capacity building** - Technical support to local communities to grow organic rice - Work with Village Marketing Network (VNM) to monitor farmer compliance on conservation agreements through remote sensing, satellite data, smart rangers **Connect to markets** - Connect farmers with buyers of organic rice (e.g. upmarket hotels, supermarkets)	– **Large scale impact on conservation protection:** opportunity to reduce depletion of endangered wildlife and reduce deforestation on a large scale – **Improve livelihood of local communities:** local communities are incentivised to reduce forest clearance through price premiums for organic rice (~50% premiums)	– **Niche market:** limited market for organic rice in Cambodia, limits potential to earn large rice revenues, and makes commercial feasibility a long term play – **Regular monitoring:** high costs of ongoing monitoring of local communities' compliance with conservation agreements – **Technical assistance:** local communities need intensive training to comply with organic rice/ certification requirements – **Assured supply:** farmers may sell rice to other middlemen for higher prices	– Reduce cost of production and increase sales volume (e.g. by increasing milling yield) to earn higher margins on organic rice – Enter into agreements with farmers for assured supply of organic rice – Build trust with local communities to create greater ownership of the programme – Diversify product offering (e.g. rice crackers); and access export markets to expand customer base – Develop effective monitoring systems such as field audits and satellite analysis to ensure compliance with land use contracts more effectively

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Stakeholder drivers and challenges

Linking payment of price premiums to farmers' compliance with conservation agreements creates stronger incentives for farmers to engage in conservation activities

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Local communities/ smallholder farmers***	**Capacity building:** - Training to grow organic rice, and comply with certification requirements - Enter into conservation (no hunting, no encroachment agreements) with WCS	– **Improved income:** Farmers are get a 50% premium; potential to get an additional 20% premium for certification – **Improved farmer skills:** Farmers trained in SRI; grow new rice varieties, maintain rice quality and water levels, etc. – **Access to new markets:** Farmers can connect to upmarket hotels, etc to sell the rice. Potential to access export markets through certification – **Land use rights:** Negotiation of land use boundaries as part of conservation agreements strengthens existing land tenure arrangements	– **Strict compliance to ensure payment:** Farmers must have been wildlife friendly for 3 years for payments to be made, i.e. no one can grow organic rice without being wildlife friendly – **Assured/ credible off-taker:** Lack of assured market/ buyers may disincentivise farmers from growing the commodity, given niche market for organic rice in Cambodia	– Engage closely with WCS to develop technical skills to grow organic certified rice – Enter into assured off-take agreements with buyers through WCS for assured product uptake

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Stakeholder drivers and challenges

The programme requires significant long term upfront investment with a long pay back period, given niche market for organic rice in Cambodia

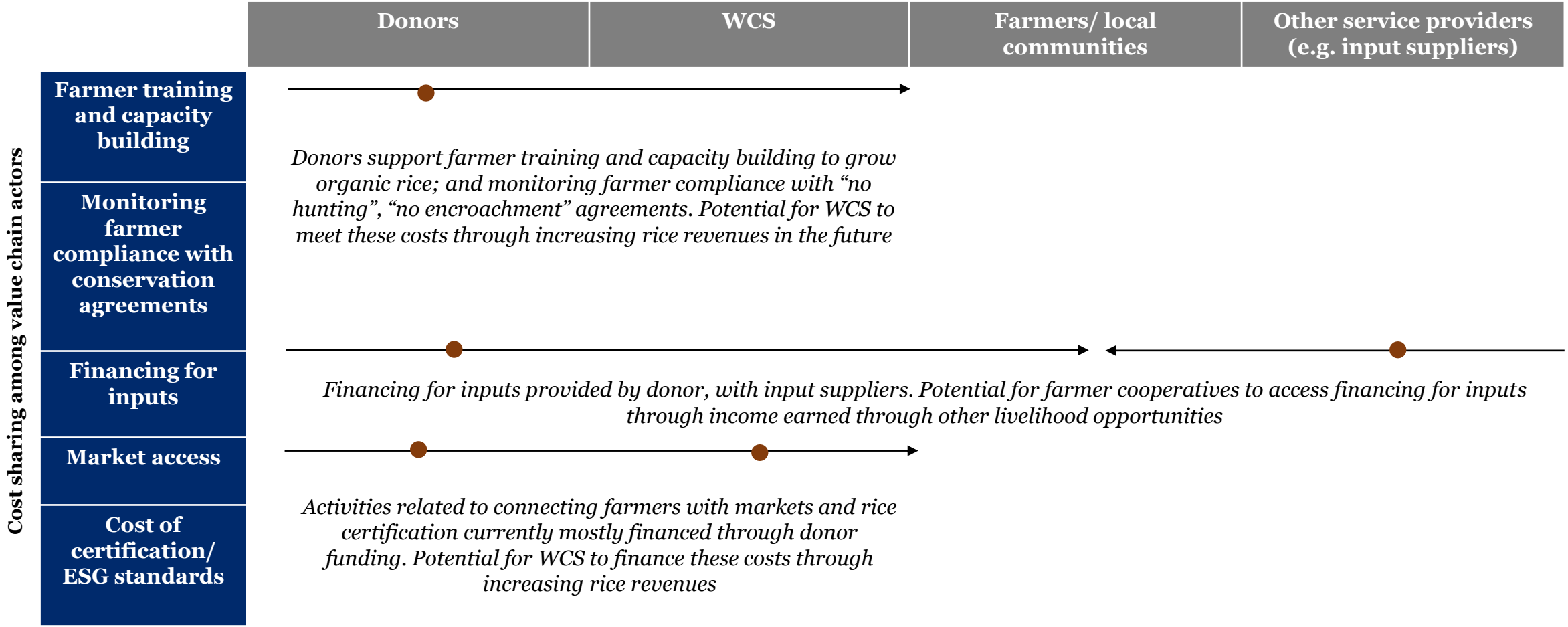
Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Donor/ funder***	**Financing activities** - Funding to WCS to set up and run the model (e.g. for farmer identification and aggregation; technical support to develop local community skills to grow organic rice)	– **Large scale impact on deforestation:** Opportunity to create larger scale impact on disincentivising local communities to engage in illegal logging and hunting by creating alternate livelihood opportunities – **Improved income for local communities:** Local communities can earn increased income through price premiums for growing organic rice	**Commercial feasibility is a long term play** – Requires significant upfront investment for farmer training; access to markets; rice certification, etc. with a long pay back period – Niche market and limited demand for organic rice, (restricted to upmarket hotels, and high end customers), resulting in long lead times to recover investments	– Target larger customer base (e.g. access export markets through certification) – Work with WCS to diversify product offering to increase rice revenues from the domestic market (e.g. rice value added products)

Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Stakeholder drivers and challenges

The project uses a systematic approach to link smallholder farmers to buyers of organic rice through village marketing networks

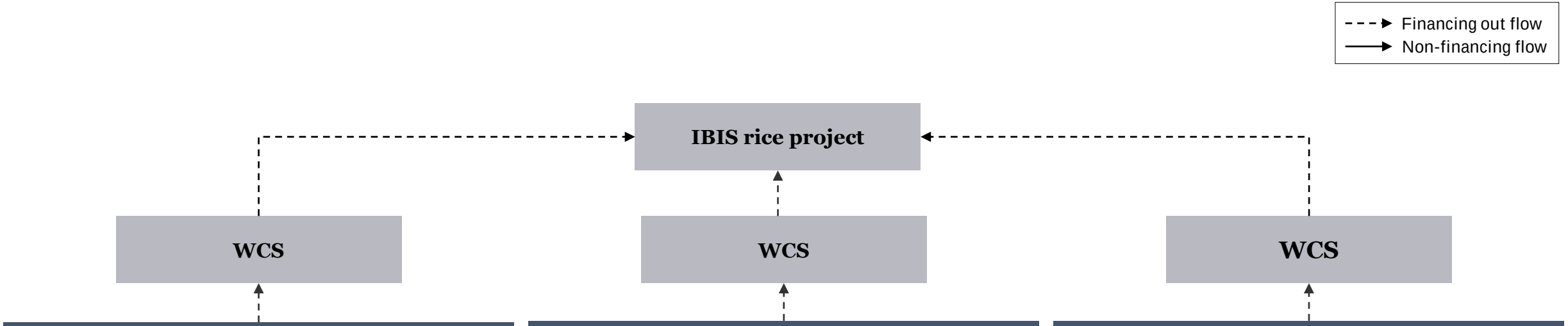
Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Village Marketing Network (VNM)	**Connect to markets** - Purchase rice from farmers and verify that farmers abide conservation agreements - Farmer payments	– **Secured business:** assured business and improved access to new markets through WCS and donor network	– **Transaction costs:** high transaction costs of monitoring farmer compliance with conservation agreements	– Develop effective systems to monitor farmer compliance (e.g. remote sensing, field audits) in partnership with WCS
Sansom Mlup Prey (SMP)	**Connect to markets** - Collect rice from participating villages to deliver to mills for processing - Rice packaging and labelling - Cash advance to VNMs for funding purchase from farmers	– **Secured business:** assurance of secured business through WCS network – **Access to markets and partners**: Improved access to buyers and partners through WCS network	– **Assured off-take:** potential lack of buyers, given limited and niche market for organic rice	– Build strong network with credible partners to ensure guaranteed uptake of organic rice

While initial donor funding is necessary to set up the model, costs of long term capacity building and sustainable commodity production can be financed by the private sector



Case study: "Wildlife Friendly IBIS rice" project by WCS in Cambodia: Potential support

The IBIS rice programme has potential to move away from donor funding towards greater commercial feasibility with a working capital loan of US$200-500k over the next 1-2 years



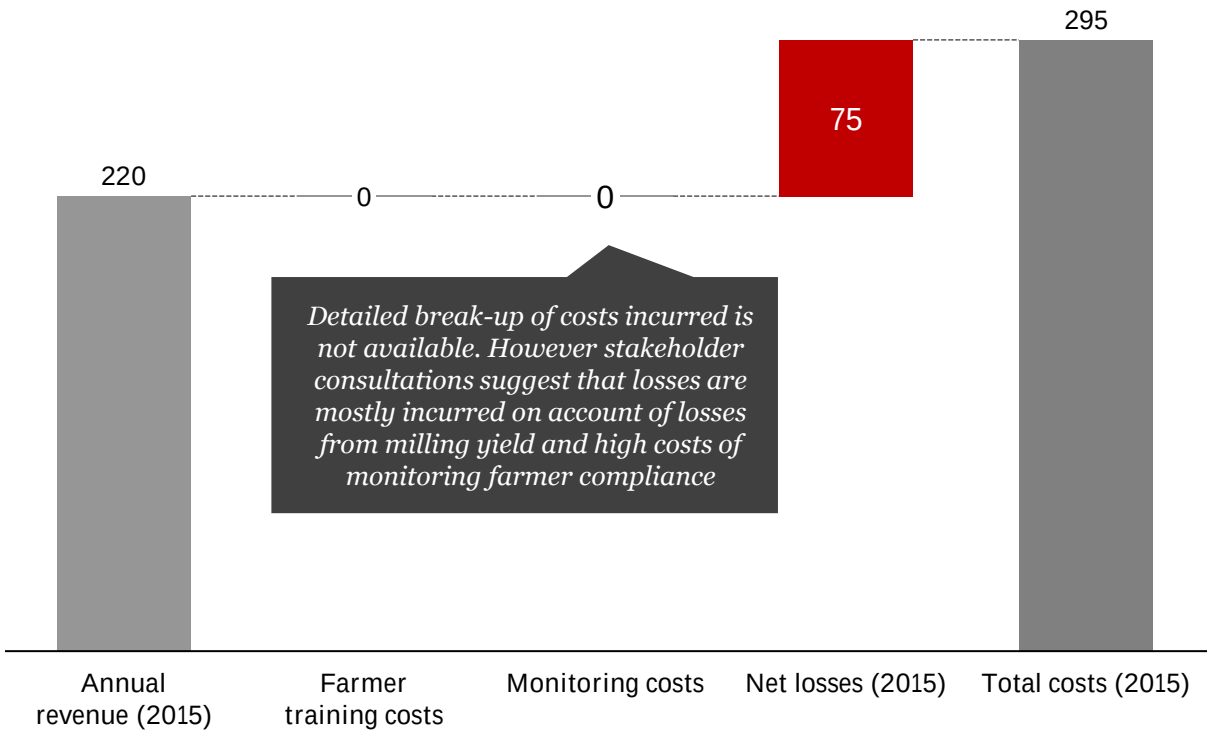
Role 1: Working capital loan to improve financial sustainability	Role 2: Initial de-risking capital to diversify product offering	Role 3: Initial de-risking capital to support rice certification for export
- Potential for programme to move towards financial sustainability through a working capital loan of US$200-500k over 1-2 years[1] - Donors could provide long term debt funding at low interest rates for the programme to reach break-even over the next 18 months[2]	- Currently, market for organic rice is restricted to]niche customers in Cambodia - Going forward, WCS is planning to diversify product offering to target a larger customer base (e.g. rice crackers, cereal) - **Initial de-risking capital** will support development of un-branded value added products for the domestic and export markets	- **Potential for donors to provide initial de-risking capital to acquire/maintain high certification costs** to access export markets for rice, and other costs associated with the certification process (e.g., setting up improved internal control systems to monitor compliance, etc.)

[1] Stakeholder consultations in Cambodia
[2] Project may not leverage as much private sector investment, given limited and niche demand for organic rice in Cambodia

IBIS is currently not operationally profitable given high training and compliance costs; however recent rice certification and consequent access to export markets is likely to increase profitability in the short-term

Costs, revenues and profits/losses for IBIS Rice Project[1]

US$ '000s (2015)



Although the IBIS rice project has been largely supported by donor funding to date…

- Low rice revenues: project was mostly funded by donor support for the almost 7 years, given niche market for organic rice, resulting in low rice revenues
- High costs: stakeholder consultations suggests costs of farmer training and monitoring compliance with conservation agreements are very high; low milling yields also increase cost of production
- Accumulated losses of US$ 75M of FY 2015

…however, there is potential to move towards greater operational profitability in the short term by accessing new markets

- Potential to earn price premiums by accessing export markets: recently acquired certification to access markets in EU and US (which increases potential to charge a 60% premium)
- Reduced cost of production: target is to reduce cost of production by increasing rice milling yields[2]
- Product diversification: potential to earn increased revenues through expanding product offering (e.g. rice crackers, cereal) for the domestic and export markets (although more long term)

[1] Figures provided by WCS
[2] Increasing milling yield by 40% reduces cost of production by 10% (from US$0.84/ kg to US$0.77/kg). Target us to increase rice production to 5-10k

Annexure

CASE#7
IBIS WILDLIFE-FRIENDLY RICE

NGO **SME** **USDA CERTIFICATE** **ORGANIC RICE** **CAMBODIA**

BUSINESS MODEL

- Ibis Rice provides loans, training, and procures deforestation-free, USDA organic and wildlife-friendly rice from participating farmers inside protected area through village cooperatives.
- Wildlife conservation and avoided deforestation (WCS)
- Premium price from domestic niche and export market (Sansom Mlup Prey)

CASE#7
IBIS WILDLIFE-FRIENDLY RICE

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
FORESTRY				
AD	Clearance of protected area for rice field expansion is not allowed (conservation agreement)	42.7	NA	NA
AGRICULTURE				
Fertilizer and nutrient management	Optimal use of organic amendments to enhance soil nutrient	0.62	0.02	1.42
Residue management	Use of rice residue as compost (avoidance of burning rice residue)	0.72	-0.44	1.89

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CASE#7
IBIS WILDLIFE-FRIENDLY RICE

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)
	AVERAGE
AD	42.7
Fertilizer and nutrient management	0.62
Residue management	0.72

AREA	ER ESTIMATES (tCO2e/yr)
	AVERAGE
945	40,351
3,150	1,953
3,150	2,268
TOTAL	44,572

ASSUMPTION

- The project reduces deforestation in area equal to 30% of project area, outside project boundary
- Fertilizer and nutrient management and residue management applies to all project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

CASE#7
IBIS WILDLIFE-FRIENDLY RICE

CO-BENEFIT

	CRITERIA	ACTIVITY
	Soil quality	• Use of organic amendments helps maintain soil structure and increase its nutrient-holding capacity a • AD reduces potential soil quality and carbon disturbance
	Water quality	Lowered risk of water contamination due to reduced use of agrochemical and AD
	Biodiversity	• Biodiversity increases due to no-hunting agreement • AD preserves natural habitat for wildlife

Knowledge brief #8

Forest conservation/ reforestation through sustainable agricultural production

WWF supports sustainable coffee production to avoid forest encroachment by smallholders in Indonesia

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Case study: WWF supports sustainable coffee production to avoid forest encroachment: Description

WWF, in partnership with private sector off-takers like Nestle, is supporting smallholders to produce sustainable coffee in villages surrounding the national parks to prevent further encroachment and to protect their biodiversity

Smallholder farmers and cooperatives need to find alternate sources of income to sustain themselves without encroaching protected areas

- Solution: Smallholders adopt sustainable agricultural practices to produce coffee by receiving technical support, and capacity building from WWF and private sector off-takers like Nestle. They are able to increase incomes by having access to markets through advance purchase commitments from Nestle
- Challenge:
  - *Lack of market access:* smallholder farmers face the risk of not getting assured returns in the absence of advance purchase agreements from off-takers
  - *Lack of awareness*: farmers may not understand the long term benefits of sustainable coffee production

Private sector off-takers like Nestle want to secure long term supply of sustainable coffee to meet reputational commitments or to access export markets

- Solution: Coffee companies work with WWF to support smallholders through co-funding for training and capacity building and through advance market commitments to produce sustainable coffee.
- Challenge: *Lack of assured supply:* Smallholders may sell to other buyers for a higher prices, in the absence of a contract, thus discouraging off-taker to fund the entire training costs

WWF seeks to reduce current encroachment and prevent further encroachment in national park area by providing sustainable alternate livelihoods to the smallholders around the parks

- Potential solution: WWF provides training, capacity building and market access to smallholders to help them produce and sell sustainable coffee in villages surrounding the Barisan Selatan National Park. This ecosystem of support enables smallholders to enhance their productivity and increase incomes and thus prevents them from encroaching
- Challenge:
  - *High costs* of reforestation, training and capacity building for smallholders and monitoring for encroachment; lack of funds
  - *Lack of market access* leading to unsustainable incomes for smallholders results in limited uptake of newer sustainable production methods and continued encroachment

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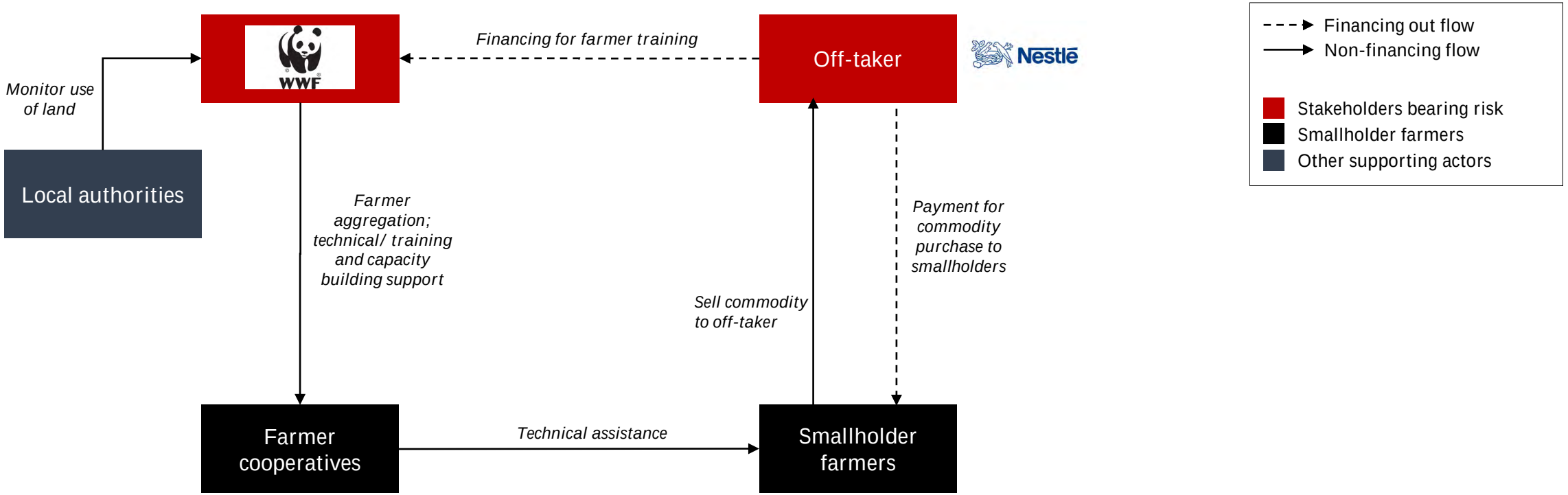
While the model has high potential for impact, commercial feasibility and scalability are dependent on market access for smallholders and formation of sustainable farmer cooperatives

Criteria	Assessment	Scoring
Impact potential	- Potential for high GHG emissions reduction through two ways: (i) replacement of forest encroachment with reforestation and conservation/ avoided deforestation (c.42.7tCO2e/yr/ha)[1] – potential to rehabilitate c.100k ha in c.300k ha of Bukit Barisan Selatan national park[2] (ii) adoption of sustainable practices to enhance productivity of smallholders for good-quality coffee (estimated 0.62tCO2e/yr/ha)[1] – WWF supported 3 villages with Nestle and is supporting 5 villages with global WWF network around the national park; an; however need to establish a monitoring system to calculate the ER achieved to date - Significant co-benefits: Reduction in encroachment & reforestation of previously encroached land helps preserve biodiversity & threatened species in the area ; Assured & increased income for farmers through increased productivity & advance market commitments	●
Economic effectiveness	- High potential for commercial feasibility due to presence of large private sector off takers like Nestle. With initial support from WWF in farmer aggregation and training, Nestle was able to work with 3 in the longer run, with no additional donor support - Initial support required for high upfront costs of reforestation, development of barren land in surrounding areas, training of farmers to adopt sustainable practices and continuous oversight and monitoring to ensure no encroachment in the national parks	◕
Innovation and scalability	- Mature model: Securing sustainable supply of coffee production is a mature model for coffee companies however, the model adds additional costs of reforestation and maintenance of surrounding national parks. Private sector can be incentivised to provide support as this helps them prevent illegal production of coffee and thus meet sustainability commitments and maintain reputation - High potential for scalability given alignment of incentives of all stakeholders and developed training process by WWF; Advance market commitment from other off-takers like Nestle & formation of self sustainable farmer cooperatives could add to the ease of scaling - High potential for replicability : Well developed proven model, that can be replicated for other commodities and geographies. Dependence on local conditions and private sector off taker may limit the potential for replicability	◕
Other assessment factors	- Strong support partner network but need more private sector partners/off takers: Presence of a strong partner like WWF that has experience and has proven success. However high dependence on private sector off taker to make the model commercially sustainable. Need to identify more guarantee buyers like Nestle to scale programme for coffee and to replicate it for other commodities - Weak enabling environment; Appropriate regulations for conservation but weak enforcement by the government. Unclear land rights, limiting the potential of partners like WWF to scale their programmes	◑

[1] *See annexure;* [2] *WWF Indonesia website*

The programme effectively links Nestle and other off-takers with smallholders through a market based mechanism to secure sustainably grown coffee to meet their global/ business commitments



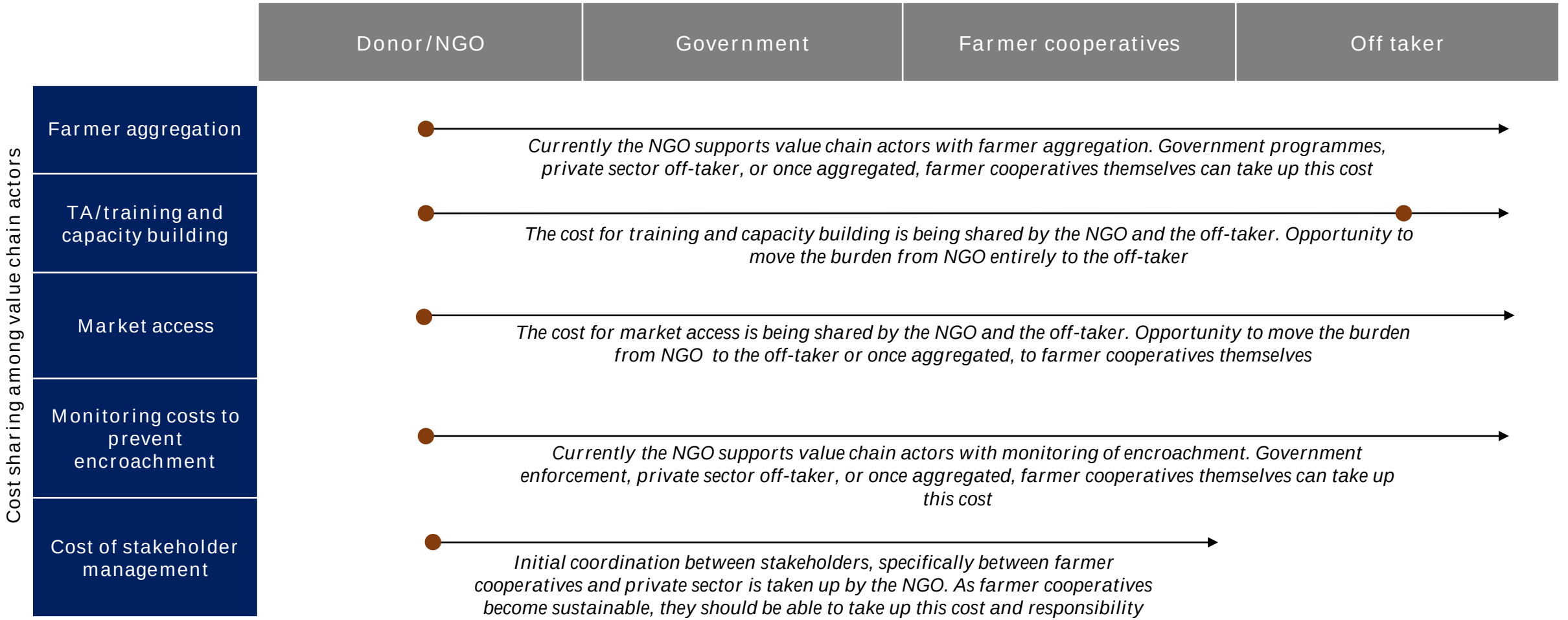
WWF, in coordination with the government, has the potential to create strong enabling environment to incentivise the private sector to participate in the programme and make it commercially feasible

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
WWF	– Financing training, reforestation and conservation and monitoring of national parks – Capacity building and training through field farming school – Access to networks: private sector off takers, other donors and funders	– Protection of biodiversity and endangered wildlife species in national parks. reduce and prevent further encroachment into the national park areas by creating alternate livelihood options in the surrounding villages	– Limited funds for training and monitoring for encroachment – Limited access to markets for smallholders to increase uptake of sustainable agricultural production – Dependence on local authorities to enforce regulations to prevent encroachment	– Have cost sharing agreements with local authorities and private sector off takers – Target coffee companies that have reputational risk hence have to be committed to legal, sustainable production
Government/ local authority	– Enabling factors like stronger enforcement of regulations to prevent encroachment and illegal activities and clearer land rights of smallholders and easier permits process	– Better enforcement of regulations to prevent further encroachment in the national park area – Prevent illegal grown coffee and other commodities from infiltrating international trade	– Limited funds and capacity and misaligned political incentives for proper enforcement of regulations	– Have cost sharing agreements with large coffee companies and other donors

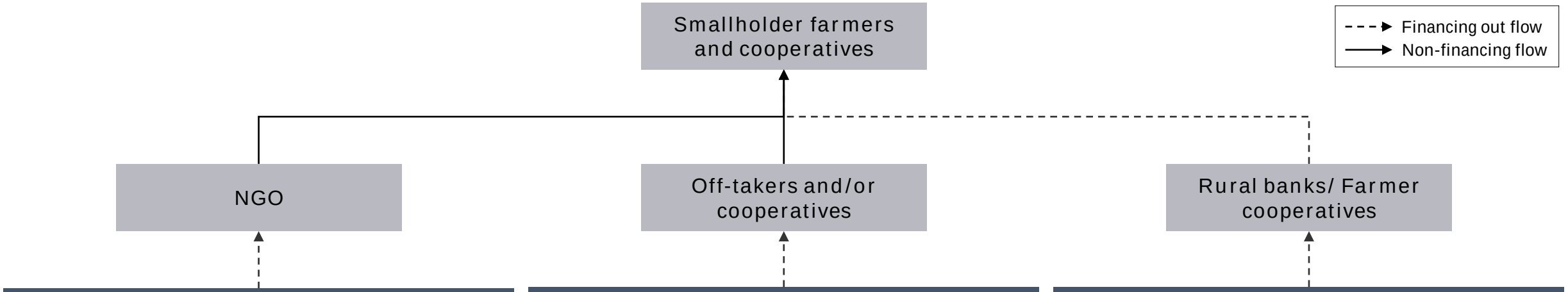
Advance market commitments from off-takers and farmer aggregation and stakeholder management from farmer cooperatives can ensure long term sustainability of the programme

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Nestlé *Off-takers*	– Access to network: provide market access to smallholders – Co-finance TA for farmers to adopt sustainable practices	– Secure supply of sustainable coffee and reduce illegal production in protected areas to meet global commitments, avoid reputational risks and/ or access key export markets	– Lack of assured supply Smallholders may sell to other buyers for a higher prices, in the absence of a contract – Lack of funds: tension between purchasing department and CSR/sustainability department limits funds to fully fund the programme	– Potential to get de-risking capital or grant funding from donor for training costs – Crowd in more off-takers to share upfront costs – Ensure secure supply through: (i) Signing a contract farming MoU with smallholders (ii) Building trust and awareness among smallholders (iii) Providing results based financing to farmers
Smallholder cooperatives	– Capacity building: Ensuring capacity building and uptake of sustainable practices by smallholder members; Supporting WWF in reduction and prevention of encroachment into national park area by members	– Increased incomes for members: Incentivised to enhance productivity to increase incomes & improve livelihoods – To become self sustainable: increased productivity from same area leads to increased business	– Lack of incentives to change status quo of members due to discontinuous programmes from donors; lack of market access to recover increased costs of sustainable practices, lack of finances to adopt new practices	- Leverage donor and other stakeholder funding for capacity building - Leverage advance purchase agreements from private sector off takers

Although this initial donor support is currently still necessary, the cost bearing responsibility should gradually shift to the private sector in later phases as the model is validated within the local context



Donor and multilateral agencies can catalyse private sector engagement by working with the relevant stakeholders to de-risk engagement and address the key challenges for smallholders in an initial phase



Role 1: Grant funding for technical assistance/training	Role 2: Grant funding for other value chain activities	Role 3: Loans to smallholders
Grant funding to finance capacity building programmes provided to smallholder farmers by a partner NGO (or other stakeholder); additionally can fund market building/connection to corporate networks programmes	Grant funding to support value chain activities associated with the programme (e.g., cost of inputs and equipment, market access)	Financial support to smallholders in the form of start up or working capital loans to enable them to invest in new sustainable practices (e.g. , better inputs, better preparation of land). Reduce associated risks by involving advance market commitments from off-takers and crop insurance from insurance providers

Annexes

CASE#8
WWF COFFEE

NGO | **INPUT SUPPLIER** | **COFFEE** | **INDONESIA**

BUSINESS MODEL

- WWF aggregates local communities nearby national park and provides training and grant to set up coffee plantation

- Alternative livelihood to discourage deforestation and encrochment

CASE#8
WWF COFFEE

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
Avoided deforestation	Reduced forest encroachment (illegal coffee plantation inside national park)	42.7		
Fertilizer and nutrient management	Efficient use of natural fertilizer and insecticide	0.62	0.02	1.42

CASE#8
WWF COFFEE

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/yr)			AREA	ER ESTIMATES (tCO2e/yr)		
	AVERAGE	LOW	HIGH		AVERAGE	LOW	HIGH
Avoided deforestation	42.7	NA	NA	??	42.7	NA	NA
Fertilizer and nutrient management	0.62	0.02	1.42	??	0.62	0.02	1.42

CASE#8
WWF COFFEE

CO-BENEFIT

CRITERIA	ACTIVITY
Productivity	Improved productivity due to efficient use of agrochemical
Soil quality	Optimal use of fertilizer helps maintain soil structure and increase its nutrient-holding capacity

Knowledge brief #9

Watershed management to secure water resources via PFES

Manila Water's watershed programme in Philippines

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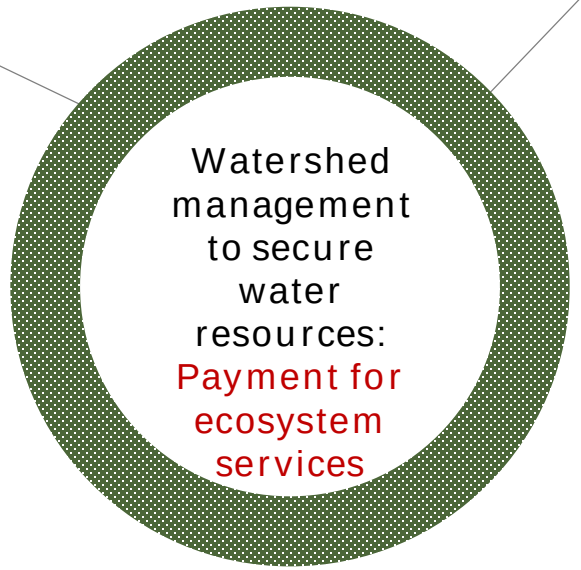
With its annual PFES, Manila Water, in partnership with BK Foundation and another private sector company, is sustainably maintaining and protecting the 2700 ha Le Mesa watershed

Local communities need to find sources of income to sustain themselves without cutting down forests and undertaking illegal activities

- Potential solution: Local communities receive employment as forest guards or in the Le Mesa EcoPark from private sector companies through the Bantay Kalikasan Foundation (BK)
- Challenge:
  - *Lack of long term commitment from stakeholders:* Short term programmes from donors, NGOs and private sector; forced to move back to illegal unsustainable practices with gaps in capacity building support and PFES
  - *Lack of economic incentive:* Incomes made through illegal activities like illegal logging may be more than PFES in the short run. Lack of awareness about long term benefits of sustainable practices, therefore no incentive to shift practices.
  - *Employment vs independent livelihood:* difficult to convince/ train local communities to shift to employment from individual occupation



Manila water wants to preserve Le Mesa watershed in order maintain continuous supply of water and avoid extra water filtration costs

- Potential solution: Manila Water pays an annual fixed fee to an on ground foundation, BK, who works with the local community to preserve the Le Mesa Watershed
- The foundation generates additional funds for the watershed management by running an ecotourism site called the Le Mesa EcoPark
- Through funds raised from Manila Water and other private sector companies as PFES and other sources, BK provides employment to the local community for long term management of the watershed
- Challenge:
  - *Limited contract periods for stakeholders:* The contract for BK to end in Dec 2016; No clear transition plan to continue watershed management
  - *Inefficient management by MWSS[1]:* Although responsibility for watershed management with MWSS, lack of institutional capability and political will to provide support

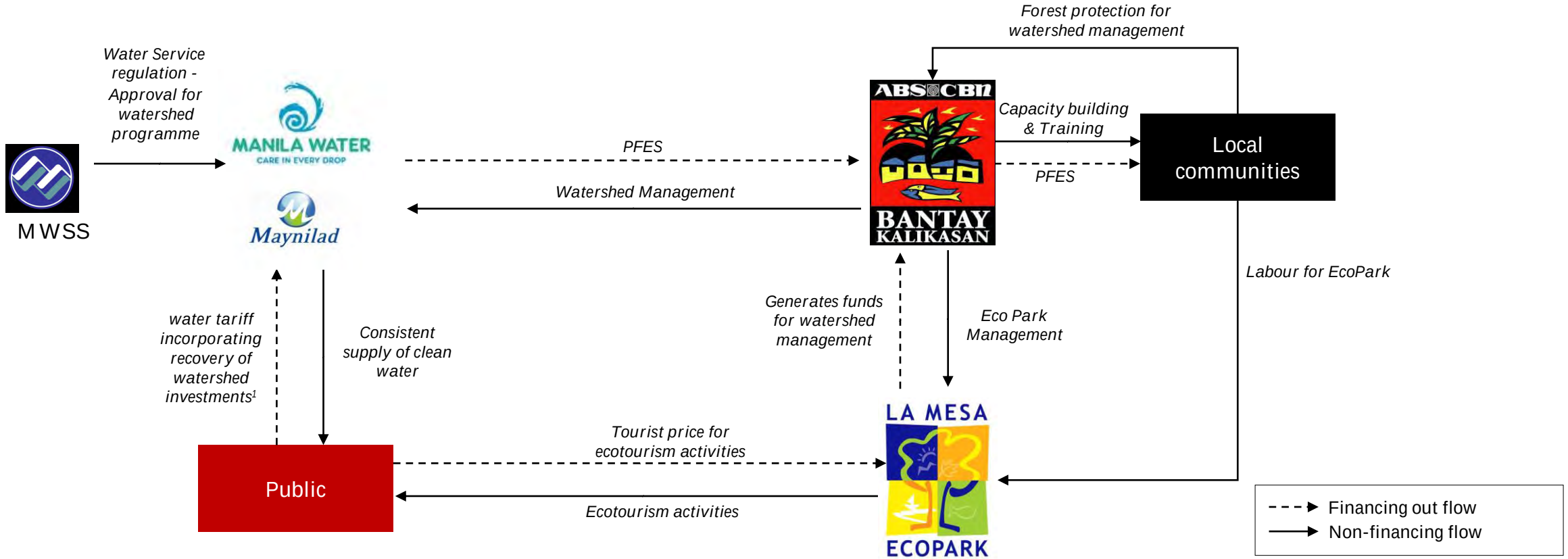
[1] Metropolitan Waterworks and Sewerage Systems

Le Mesa watershed is an example of a highly impactful and commercially sustainable watershed recovery initiative, however its scalability and replicability remain to be tested

Criteria	Assessment	Scoring
Impact potential	- Potential for high GHG emissions reduction by rehabilitation of forest cover. 56% increase in forest cover by restoration of 1500 ha of the 2700 ha of Le Mesa watershed using 86 [1] species of native trees and effective forest protection; an estimated c.7-8 KtCO2e/yr. reduction [1] - Significant co-benefits: Improved livelihoods for approx. 2000 [2] local community/ illegal settler families by providing them alternative jobs like forest guards or employment in the Le Mesa Eco Park; Preservation of biodiversity, soil conservation, increase in tree diversity	●
Economic effectiveness	- Strong potential for economic effectiveness: Though initial funding from private donors – US$ 5 m [1] for watershed management and US$12.5 m [1] for reconstruction of Le Mesa EcoPark, now economically sustainable: 50% of operational and maintenance cost through payment for ecosystem services (PFES) by Manila Water (US$180k) and Maynilad Water Services (US$180k) ; Additional 50% of the costs through revenue Le Mesa EcoPark (eco tourism) [2] - Long term sustainability - PFES from the private sector concessionaires accounted as a business cost and factored into the water price charged to customers	◕
Innovation and scalability	- Scaling concept: few successful examples like Le Mesa watershed; Quantification of costs and benefits required to make the model more mainstream for private sector - Potential for scalability to be tested– able to scale to entire 2700 Ha of Le Mesa watershed. However, may not be possible to scale to larger much larger watersheds (e.g. Ipu – 26,000 Ha) due to small scale activities like eco tourism and limited private sector investment [2] - Medium potential for replicability – high dependence on local conditions and stakeholders involved; BK successfully initiated a replicable model at IPU watershed but was terminated midway due to lack of alignment between stakeholders	◑
Other assessment factors	- Misalignment in government incentives: Agreement with MWSS through a CA to recover costs of PFES through increase in tariff to customers however MWSS hesitant to increase tariffs for political reasons causing delays in approval of programmes [2] - Existence of credible/capable partners: BK is an environment focused foundation with sound leadership with two decades of successful experience in watershed management at Le Mesa. Manila Water is an environmentally conscious private sector company that has been active in watershed management activities since decades but has taken up a more serious approach since 2011. Formed a coalition with other private sector companies to aggregate efforts	◑

Assessment based on Dalberg analysis and stakeholder meetings; [1] See annexure; [2] From stakeholder meeting with Manila Water

In addition to the annual fee from Manila Water and capacity support from BK, revenue from Le Mesa EcoPark makes a substantial contribution to the commercial feasibility of Le Mesa watershed management



[1] Through a Concession Agreement (CA) with MWSS, the concessionaires (Manila Water and Maynilad Water Services) can recover all their investments within the concession period through the tariff, allowing for an added appropriate discount rate (ADR) which is determined by the MWSS regulator. Every five years, the two concessionaires submit an investment plan that is reviewed and approved by the regulator. The regulator takes note of the still unrecovered investment ('opening cash position') and determines the water tariff that would ensure the full recovery of all investments and operational costs by 2037.

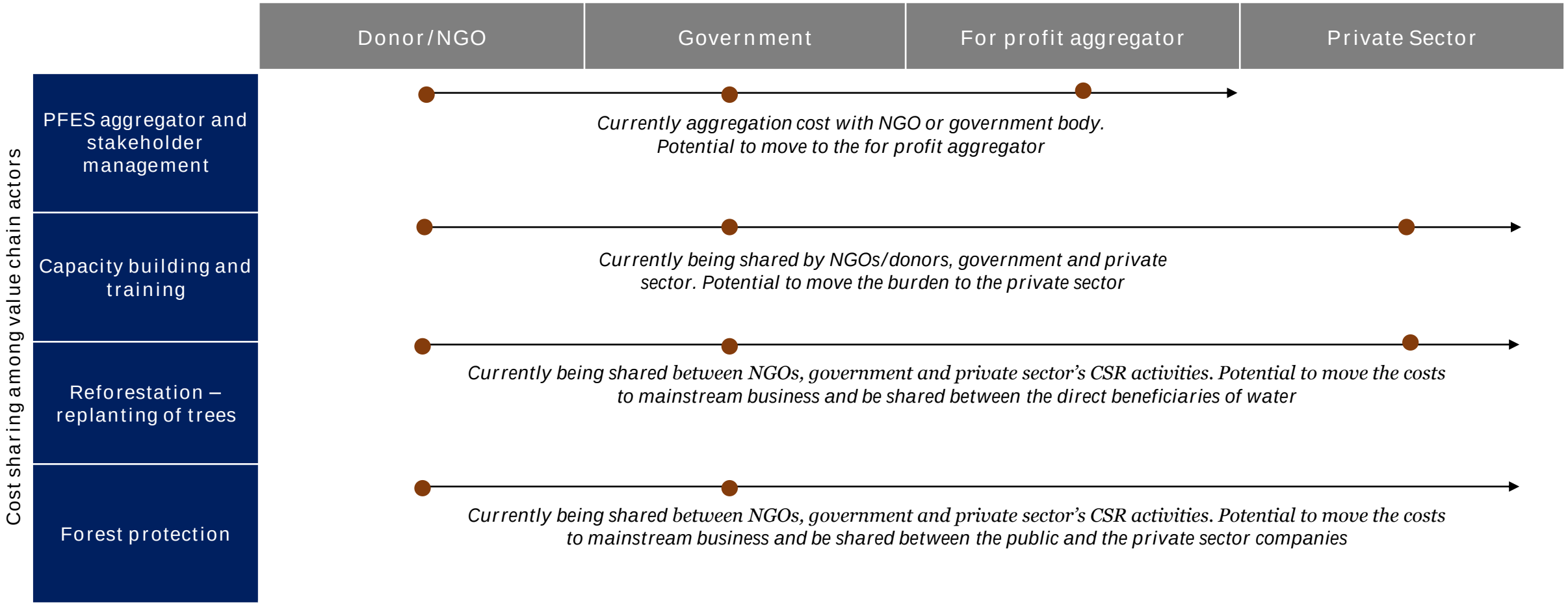
Although Manila Water allocates funds for watershed management, MWSS underutilises them due to political fear of increasing water prices for public

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
MANILA WATER CARE IN EVERY DROP	- Finances watershed management: Along with Maynilad, pays an annual fee of US$180k to Bantay Kalikasan Foundation (BK) to manage Le Mesa Watershed area	– Supply of consistent and clean water: incentivised to conserve the water source through watershed management to avoid extra costs for consistent supply of clean water (e.g. filtration costs)	– Lack of institutional capability and political will of MWSS: Political issues with increase in water prices, underutilised allocated PFES – Risk of continuation without an on ground partner after end of BK's contract	– Introduce independent programmes, in coordination with other stakeholders, limiting MWSS role to approval of the programme
MWSS	- Approval for finances: responsible for approving watershed programme for concessionaries and aligning with BK Foundation for implementation of Le Mesa watershed management	– Sharing of economic burden with private sector: PFES from private sector reduces the economic burden on the government to manage and conserve watersheds and water sources	– Political misalignment with increase in water prices: Private sector collects watershed management fee from public by increasing water prices. Political issue for MWSS	– Quantify benefits for Manila Water to incentivise them to internalise part of the costs without transferring to public

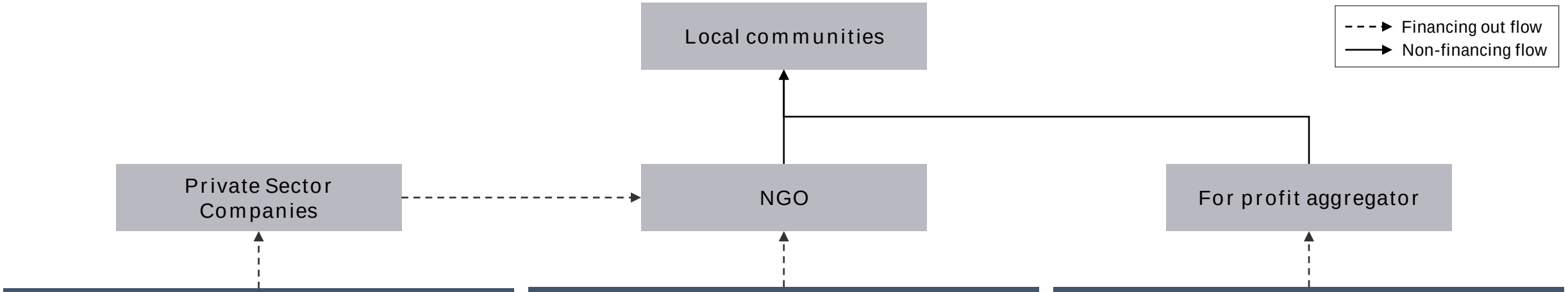
BK has been able to build a sustainable watershed model, employing local community and generating funds from ecotourism, however, their ending contract with no transition plan may disrupt the model

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
ABS-CBN BANTAY KALIKASAN	- Capacity building: Receives funds from water concessionaires and EcoPark to build capacity of local community to rehabilitate and manage watershed areas	– Opportunity to create environmental and social impact: environmental impact by restoring and conserving watershed area and social impact by providing alternate sustainable livelihoods to local communities	– Unable to create desired impact due to: – Limited period contract to manage watershed – Inconsistent/ short term funding programmes from private sector – Misalignment of incentives of government and private sector leads to less funds	– Create self sustainable programmes. Generate funds from forest activities like eco tourism, NTFPs etc.
Local community	- Employed by BK for watershed management and EcoPark services	– Opportunity to increase incomes through sustainable livelihoods (e.g. forest guards, replantation of trees, services in EcoPark)	– Lack of trust and incentive to switch due to: – Constantly changing supporters on the ground – Short term financing and support from private sector – Not enough income rise through alternate livelihood	– Employment in EcoPark to reduce dependency on watershed management programmes

For long term sustainability of the model, the stakeholders benefiting from watershed management should be incentivised to make consistent payments for the ecosystem services



Donor and multilateral agencies can catalyse PFES from the private sector for long term maintenance of watersheds by sharing the initial burden of reforestation and rehabilitation

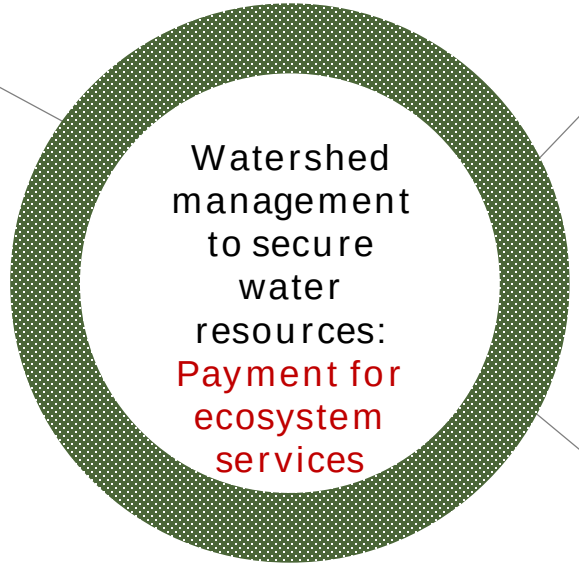


Role 1: Initial funding for reforestation	Role 2: Grant funding for capacity building	Role 3: Funding to set up a for profit aggregator for PFES
Incentivise private sector companies to commit to long term PFES for maintenance of watersheds by sharing the high upfront costs of initial reforestation activities.	Grant funding to finance capacity building programmes provided local communities by a partner NGO (or other stakeholder); additionally can fund market building/connection to corporate networks programmes to develop alternate forest based livelihoods like ecotourism, NTFPs	Initial de-risking capital to set up a for-profit aggregator for watershed management. Aggregator charges a fee for its services in return of economies of scale to private sector. Responsibilities include (i) quantification of benefits to private sector (ii) enrolment of private sector for PFES and (iii) on-ground watershed management activities

A group of production concessions, ecosystem restoration concession and a village forest, covering 70,000 Ha of land, are working together to rehabilitate and conserve the landscape – peat, water and land area

Ecosystem restoration concessions need to restore and conserve the forest cover under it, sustainably and profitably

- Potential solution: Ecosystem restoration concession receives performance based fees from other surrounding production concessions to rehabilitate and conserve the forest cover in the landscape
- Challenge:
  - *Lack of commitment from production concessions* without quantification of costs and benefits of ecosystem restoration services
  - *Large upfront investments not recoverable through PFES:* dependence on donor funding for initial reforestation activities. Potential to develop ecotourism or NTFPs for additional commercial benefits



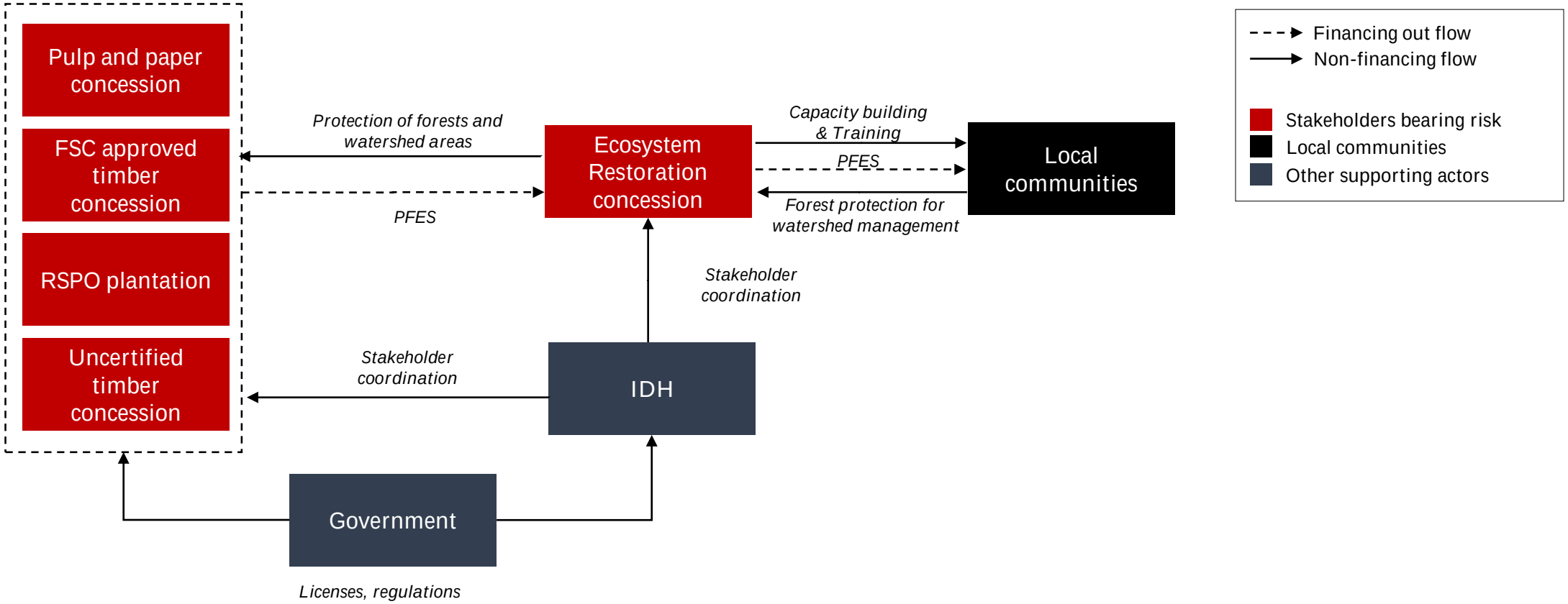
Uncertified production concessions wish to increase productivity and have security against encroachment and forest fires to make higher profit margins

- Potential solution: Uncertified production concessions pay a performance based fee to the ERC to its ecosystem restoration services.
- Challenge: *Unclear cost benefit analysis:* PFES may be more than cost savings through productivity enhancement and forest security

Certified production concessions wish to remain certified with minimal certification costs, to be able to access export markets and make higher profit margins

- Potential solution: Domestic buyers cover a part of certification costs through direct funds or by providing advance market commitments with price premiums.
- Challenge:
  - *Fear of free riding by neighbouring concessions,* specifically non certified concessions due to lack of clear incentives.
  - *Risk of losing money:* Lack of participation from other concessions leading to lack of total funds to sustainably maintain ERC

Supporting actors, including the local government and the NGO, have a key role initially to bring together all stakeholders to work in coordination and contribute for landscape management



Annexure

CASE#8
MANILA WATER WATERSHED PES

Manila Water

LARGE DOMESTIC COMPANY

WATERSHED MANAGEMENT

PHILIPPINES

BUSINESS MODEL (incubation)

- Manila water pays performance-based fee, as required by 25-year water concession agreement, to NGOs to undertake reforestation and sustainable forest management activities in the watershed area from where it receives water supply.

- Fulfilment of water concession requirement

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CASE#8
MANILA WATER WATERSHED PES

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
FORESTRY				
Restoration of degraded land	Restoration of degraded land surrounding watershed area by erosion control, organic amendments, nutrient amendment	3.45	-0.37	7.26
A/R	Reforestation	2.75	1.7	3.8
SFM	• Protection and management of existing forests • Forest regeneration and reduced degradation	1.5	NA	NA

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CASE#8
MANILA WATER WATERSHED PES

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/ha/yr)
	AVERAGE
Restoration of degraded land	3.45
A/R	2.75
SFM	1.5

AREA	ER ESTIMATES (tCO2e/yr)
	AVERAGE
810	2,795
1,728	4,752
113	170
TOTAL	7,717

ASSUMPTION

- Restoration of degraded land is conducted in 30% of project area
- A/R is conducted in 64% of project area
- SFM is conducted in 4.2% of project area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

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CASE#8
MANILA WATER WATERSHED PES

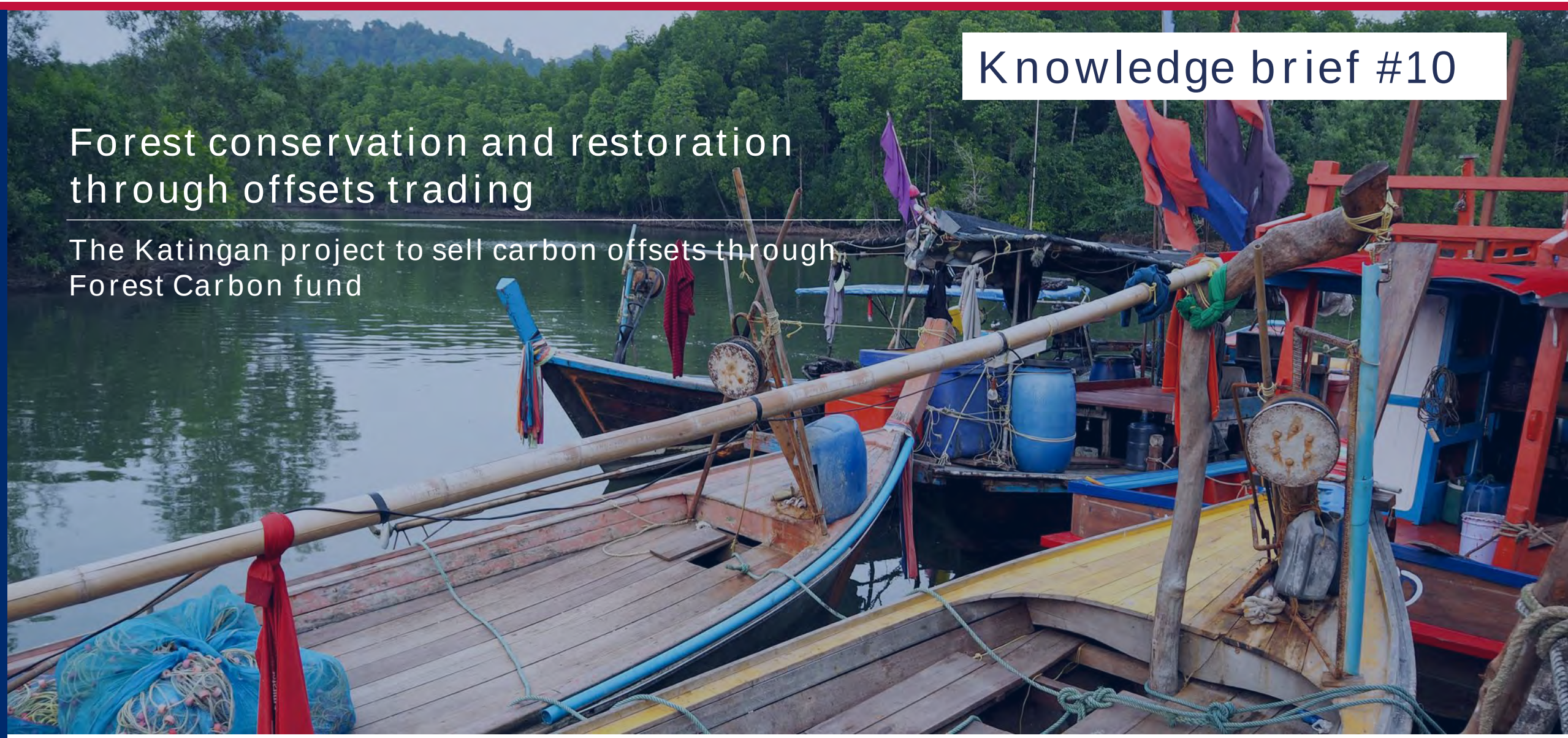
CO-BENEFIT

	CRITERIA	ACTIVITY
	Soil quality	• Soi conservation practices, e.g. prvention of soil erosion • Forest regeneration and management protect mineral soil from exporsure
	Water quality	Erosion prevention from forest management and rehabilitation could reduce subsequent sedimentation of water bodies
	Biodiversity	Maintenance and increase in tree species diversity and maintenance of habitate structure

Knowledge brief #10

Forest conservation and restoration through offsets trading

The Katingan project to sell carbon offsets through Forest Carbon fund



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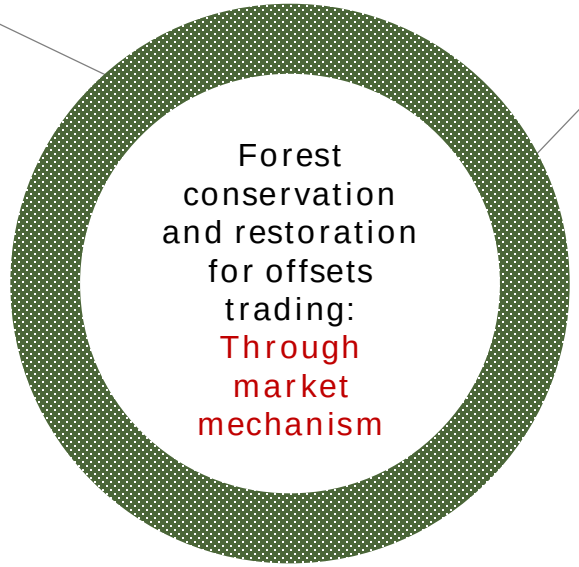
Enabling a market mechanism for ecosystem restoration concessions to securitise their carbon offsets to companies looking to compensate for their GHG emissions can catalyse private sector investment in this sector

Ecosystem restoration investors and project developers want to monetise forest conservation and restoration

- Potential solution: Private sector company finances restoration and conservation activities[1] under an ecosystem restoration concession (ERC) licence in high conservation value (HCV)/high carbon stock (HCS) forests to earn a return by securitising carbon and conservation liabilities offsets in compliance with regulatory and/or voluntary markets
- Challenge: Commercial feasibility of these projects is being proven in pilot projects, but is slow to take to scale, given:
  - *Large upfront costs:* costs of licencing, restoration, carbon accounting, engaging with local communities
  - *Lack of off-takers for offsets:* difficulty in connecting with off-takers and facilitating transactions
  - *Continued risk of illegal activities:* local communities may continue to encroach the concession for illegal logging and other activities

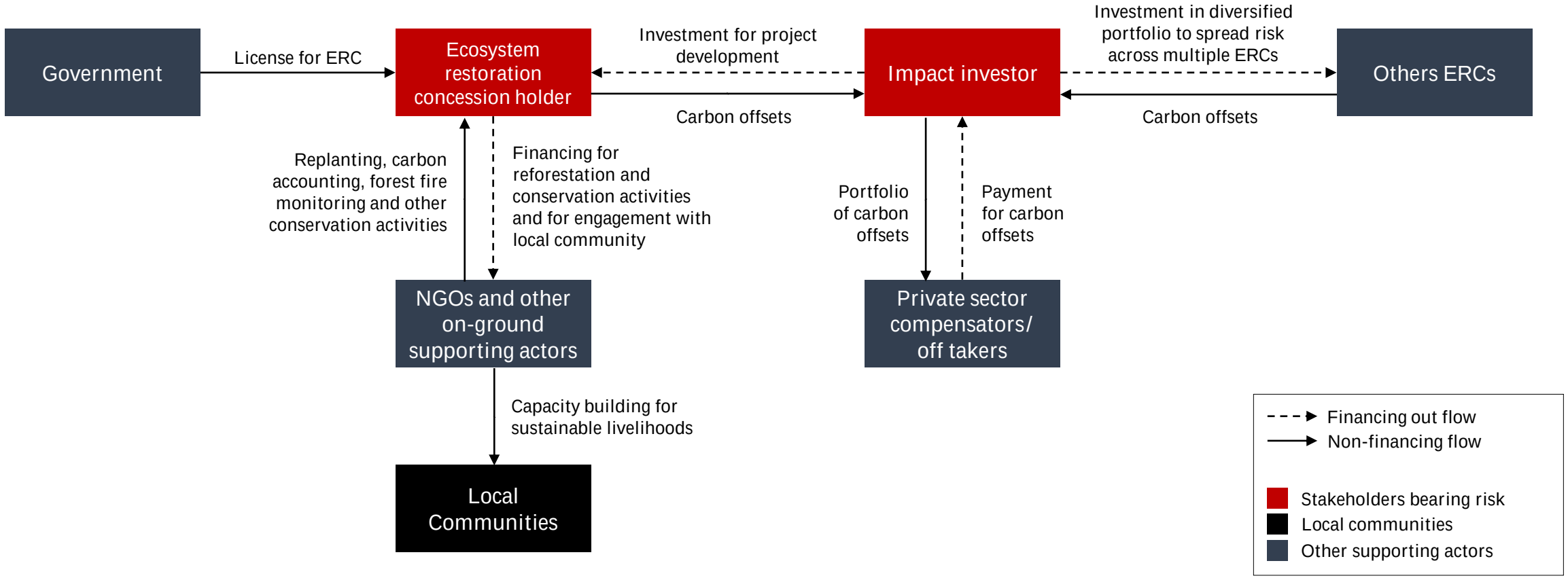


Private sector companies with 'zero deforestation' pledges and/or regulatory liabilities need to offset past and future deforestation to avoid reputational and/or regulatory penalties

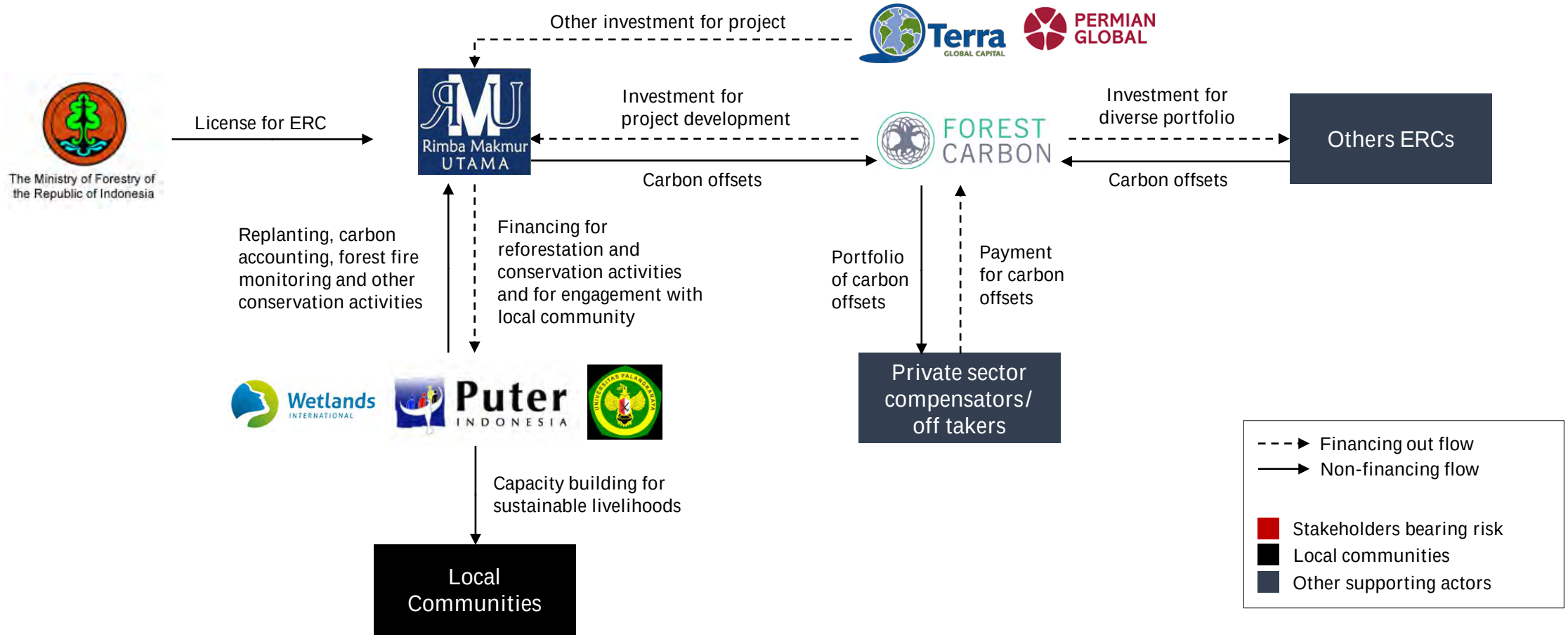
- Potential solution: Companies looking to compensate for their GHG emissions or deforestation activities pay a performance-based fee to an ERC in exchange for carbon credits/conservation offsets.
- Challenge: Despite their motivations to offset, these companies face challenges to transact with the ERC project developers:
  - *Unclear regulatory issues:* complicated regulations from government to compensate for past and future activities
  - *Pricing of offsets can be unclear:* given nascent market, pricing mechanisms are being developed
  - *Risk of insufficient offsets:* off-taker may commit to purchase credits from the ERC but risk the ERC model failing to deliver – huge economic and reputational consequences for the off-taker

[1] Restoration and conservation activities focus on three types of benefits: (i) climate and environmental benefits, (ii) community benefits and (iii) biodiversity benefits

An investment fund would aggregate and spread risk across a portfolio of ERCs to create a credible market for carbon credits and conservation liability offsets



Forest Carbon is a potential fund that is working with Project Katingan, an ERC in Central Kalimantan, and other such ERCs, to securitise their carbon offsets



While the basis of the model is to reduce GHG emissions, scalability and commercial feasibility may only be achieved with long term investments and improvements in enabling environment and market mechanisms

Criteria	Assessment	Scoring
Impact potential	- Very high potential for GHG emissions reduction: through avoided deforestation and forest degradation of High Conservation Value (HCV) and High Carbon Stock (HCS) forests; additional impact on GHG emission reduction through protection from threats such as forest fires, encroachment, illegal hunting and illegal logging - The Katingan Project – an ERC with an area of c.200k ha of peatland – achieved emissions reductions of 12.6m tons of GHG, between 2010 and 2015[1] and is estimated to reduce c.2-3mtCO2e/yr.[1] - Significant co-benefits: protection of biodiversity & creation of sustainable economic development opportunities in and around the concessions. Required to meet Climate Community and Biodiversity Standards (CCBS); soil conservation	●
Economic effectiveness	- Commercial feasibility only in the long run: (i) Large upfront costs - requires government/donor support; Reforestation costs up to US$3-4k/Ha[2] (ii) Long lead times: (iii) High maintenance costs; difficult to engage private sector looking for short term gains; - Attractive returns for SL through securitisation of carbon offsets; estimated 5% profit margin for portfolio fund[3], however there is a lack of consistent and consolidated demand - Alternative sources of income to meet costs include PFES, ecotourism, NFTPs, however very small scale and dependent on local conditions	◔
Innovation and scalability	- Innovative model that incentivises private sector investment in restoration and conservation of forests by attempting to make it profitable; however no proof of success; - Still niche opportunities – Possible to scale up or replicate the process in theory but obtaining license, high upfront costs and high dependence of on-ground work on local conditions and engagement with local communities make scaling more difficult	◑
Other assessment factors	- Difficult enabling environment: complicated licencing procedure, high costs of working with local communities, regulated and underdeveloped market mechanisms - Existence of partners, but capability needs to be tested. Many private sector companies like PT RMU are building capacity and funds like Forest Carbon are specifically focusing on creating a market mechanism for these ERCs but the model is still in early stages and the credibility of the partners is still to be tested	◑

[1] Estimate provided by The Katingan Project
[2] Estimate provided by Manila Water in Philippines
[3] Estimated portfolio return on fund with RSPO companies in Indonesia and Forest Carbon

Although the incentives of ERCs are aligned with that of the off takers, absence of simple market mechanisms like investment funds have made it difficult to create market linkages between the two

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Rimba Makmur UTAMA *ERC Holder*	- Financing conservation and reforestation activities – replantation, forest fire prevention, engagement with local community, etc. - Capacity building and management of the ERC team and on ground actors to undertake restoration and conservation activities	– Return on investment through sale of carbon credits/ conservation offsets to companies who want to compensate for their emissions and deforestation activities	– High upfront costs – Lack of sustained and centralised demand in sufficient volumes. Lack of efforts to consolidate demand	– Support creation of a fund that can consolidate demand and spread risk across portfolio of ERCS, match demand to the supply of carbon offsets
Off taker	- Offtakes carbon credits or carbon offsets for a fee as per requirements by the government or internal strategy (e.g. - RSPO Fee - $2500/Ha[1])	– Opportunity to compensate for its emissions/ deforestation activities in the short term with limited company resources	– Lack of diversity: high risk in investing in one ERC – Lack of alignment between supplier needs and regulatory requirements	– Invest/pay fee for compensation through a fund that can diversify portfolio and address regulatory requirements
FOREST CARBON *Fund*	- Connect to network and provide financing: consolidate demand from private sector compensators and invest in ERCs	– Earn a return by trading carbon offsets between ERCs and companies wanting to compensate for their deforestation activities	– No proof of concept: difficult to convince demand side to invest money	– Leverage donor money as de-risking capital

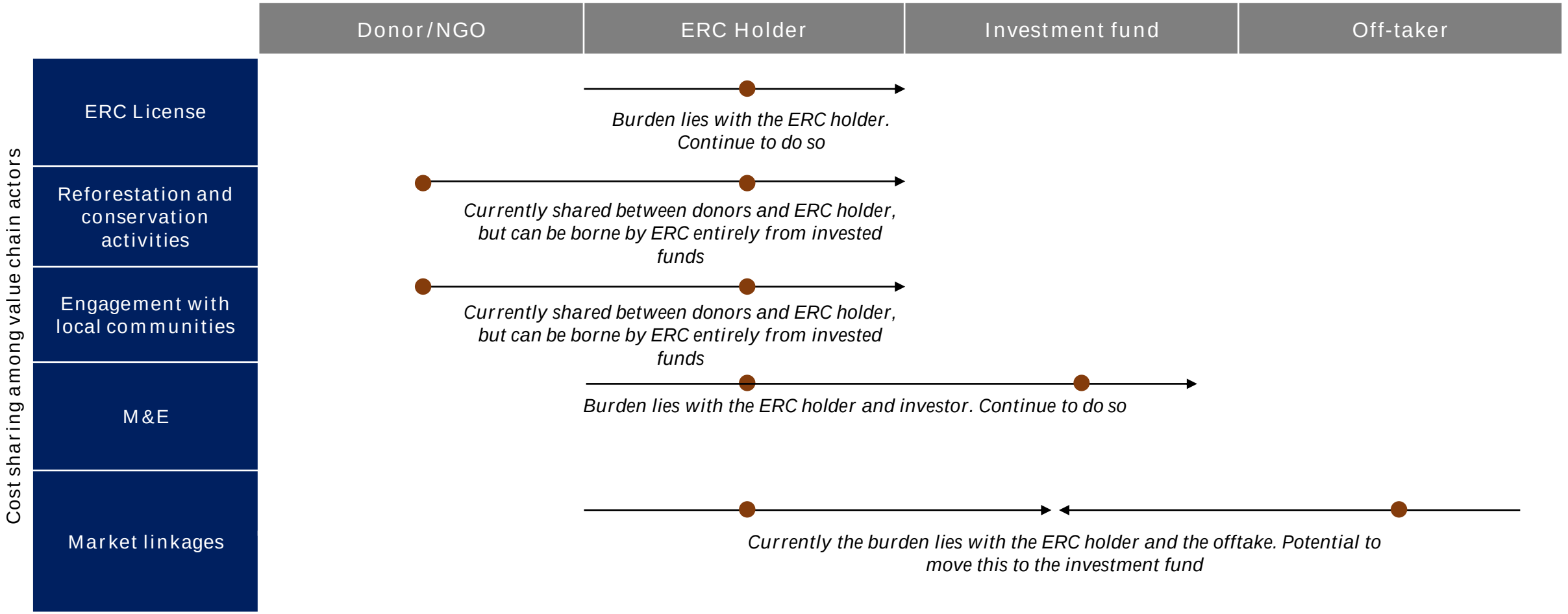
[1] Forest Carbon

Simplification of market regulations and sustainable livelihoods for local communities to prevent them from undertaking illegal activities are key requirements to make the model successful in the long run

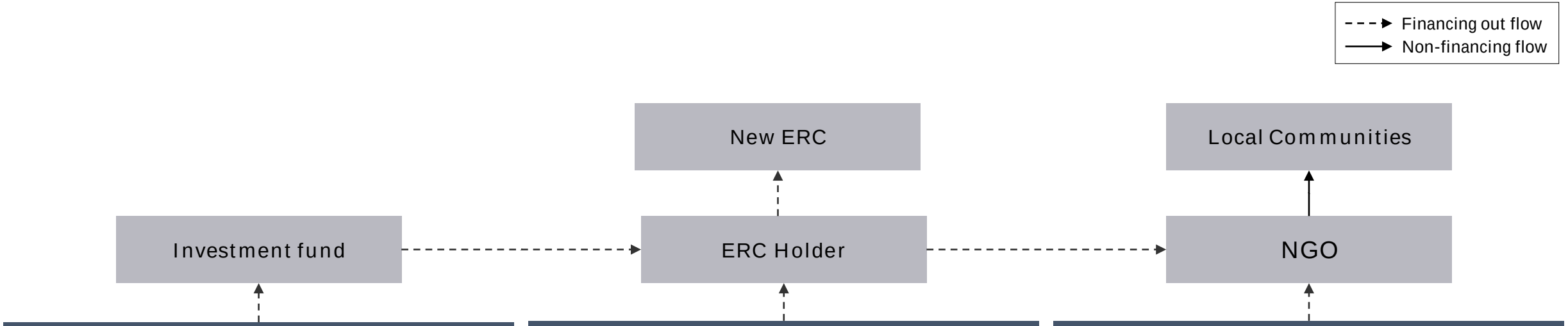
Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Government	- License for ERC : due diligence of the investor and the forest area before granting ERC	– Conservation and restoration of HCV/ HCS forests through private sector investment	– Insufficient donor money and lack of interest from private sector	– Simplify process for obtaining ERC license – Simplify market regulations for carbon trading
Wetlands International, Puter Indonesia *NGOs & other on ground actors*	- Connecting to network: Connects the concession holder to various actors on ground to provide support with replantation, protection and engagement with local community[1] - Capacity building and awareness creation among local community	– Create environmental impact through conservation & restoration of HCV/ HCS forests – Create social impact by providing sustainable livelihoods to local communities in and around concession areas	– Inability to create desired impact due to: – Lack of funds – Lack of awareness and short term vision of local communities – Weak market access for local communities	– Leverage donor and government funding for capacity building – Tie up with existing projects in the region to provide sustainable livelihoods to local community
Local Community	- Capacity building for sustainable livelihoods	– Increased incomes and sustainable livelihoods: capacity building and financial support to develop forest based sustainable livelihoods	– Insufficient support to become sustainable, leading to continued illegal activities in the ERC for sustenance and therefore fear of penalty	– Leverage capacity building and funding support to

[1] For engagement with local community to develop alternate livelihoods for conservation of forests refer to knowledge brief #8

For long term sustainability of the model, the ERCs should be able to offload their costs to private sector companies that want to compensate for their emissions and deforestation



Donor and multilateral agencies can catalyse private sector investment in ERCs by providing de-risking capital to facilitate distribution of financial burden between various stakeholders



Role 1: Long term de-risking capital to investment fund as anchor investor	Role 2: Direct off-taker for ERCs in medium-term and/or covening platform	Role 3: Short-term grant funding for capacity building
- Support the fund to raise capital to invest in ERC devel0pment projects by providing de-risking capital and acting as anchor investor - Invest in convening platforms that can match-make ERCs and off-takers to the fund to create a credible portfolio of ERCs and spread risk across ERCs and off-takers	- Incentivise ERC holders to develop more projects by off-taking their carbon inventory only in the short-term until long-term off-takers can be identified - Invest in convening platform to identify off-takers and directly match-make to ERCs, if not through a central fund portfolio	- Grant funding to finance capacity building programmes provided to local communities by a partner NGO (or other stakeholder); additionally can fund market building/connection to corporate networks programmes

Annexes

CASE#10
RMU CARBON CREDIT REFORESTATION

SME **AGGREGATOR** **FOREST CARBON** **INDONESIA**

BUSINESS MODEL (incubation)

- RMU invests in peatland restoration, and conservation throuh Ecosystem Restoration Concession and sell forest carbon credits to Forest Carbon

- Sale of forest carbon credits

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CASE#10
RMU CARBON CREDIT REFORESTATION

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
FORESTRY				
Avoided deforestation	Katingan area is under threat for drainage, burned for using as plantation (palm oil)	42.7	NA	NA
A/R	Reforestation for forest plantation	2.75	1.7	3.8
Sustainable forest management	Managment of undrained peatlands	1.5	NA	NA
Organic soil (wetland) management	Peatland rewetting	70.8	7.33	124.31

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CASE#10
RMU CARBON CREDIT REFORESTATION

MITIGATION POTENTIAL

RMU actual ER calculation (VCS standard)
12.6 mill tCO2e during 2010-2015
= 2.52 mill tCO2e/yr

CASE#10
RMU CARBON CREDIT REFORESTATION

CO-BENEFIT

CRITERIA	ACTIVITY
Soil quality	• Soi conservation practices, e.g. prevention of soil erosion • Forest management protect mineral soil from exporsure
Water quality	Erosion prevention from forest management and rehabilitation could reduce subsequent sedimentation of water bodies
Biodiversity	• Wildlife habitat protection • Prevention of unsustainable exploitation or hunting • Comprehensive program on biodiversity monitoring

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Knowledge brief #11

Forest conservation via eco-tourism

Community based eco-tourism (CBET) by the Wildlife Alliance in Chi Phat, Cambodia

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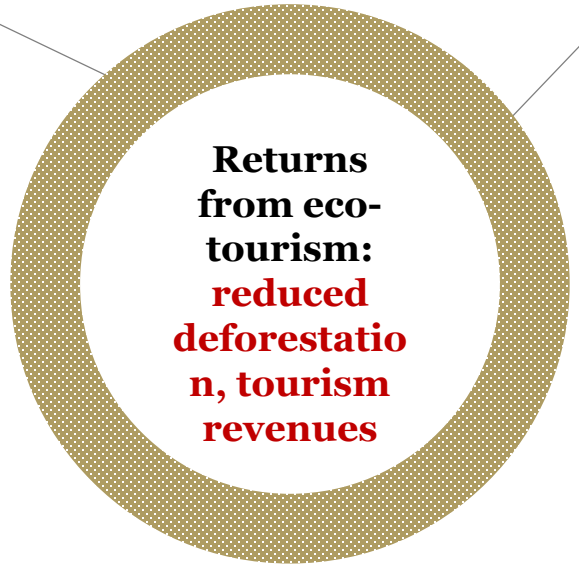
Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Table of contents

Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Description

The Wildlife Alliance is running a community based eco-tourism programme in Chi Phat to reduce deforestation, preserve wildlife and provide alternate livelihood opportunities to local communities

Local communities and villagers want to earn increased income through eco-tourism

- **Potential solution:** Local communities/villagers who were earlier planning to move out of the villages (and around the forest to deplete it of its environmental heritage) can earn income through alternate livelihood opportunities created by the eco-tourism project, i.e. by being employed as tour guides leading trekking, mountain-biking, camping, operating home stays and guest houses
- **Challenge:**
  - *Technical support to run the model:* local communities require significant handholding and training to develop skills to run the model
  - *Lack of awareness:* requires awareness building on benefits of initial investments and long-term gains
  - *Alternate livelihood opportunities:* local communities requires alternate livelihood opportunities to compensate for low visitor rate during the off-peak season



Wildlife Alliance wants to combat deforestation and wildlife extinction by providing alternate livelihood opportunities to local communities

- **Potential solution:** Wildlife Alliance wants to develop an eco-tourism model as a viable livelihood opportunity and alternate to illegal logging and hunting; and invest in developing capacity of local communities to run the model as a profitable and professional enterprise
- **Challenges:**
  - *Technical support for local communities.* provide ongoing training to villagers to: (i) run the CBET professionally; (ii) act as tour guides, host home stays and run the tourism model; (iii) create awareness among them to switch from poaching activities to tourism as their primary source of livelihood
  - *Significant long term investment with a long pay back period*: significant investments to set up and run the model; technical support to train local communities, with a long pay back period
  - *Difficult to monitor impact:* difficult to monitor impact of model on reducing slash and burn; prevent illegal hunting by villagers, etc.

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Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Assessment

Although project site is an ideal destination to attract tourists, high costs of developing local community capacity and low visitor rate during off-peak season make commercial feasibility a long term play

Criteria	Assessment	Scoring

Impact Potential	- **Project contributes to reducing GHG emissions.** project reduced slash and burn by local communities by 100%; and reduced hunting by 60%. Estimated reduction of **c.1.3-4.3M tCO2e/year**. **Other benefits:**
	  - *Improved soil quality*: protection of forests reduces potential erosion and mineral soil from exposure
	  - *Improved water quality*: forest conservation could reduce erosion and sedimentation of water bodies
	  - *Improved biodiversity*: forest protection results in tree species diversity, maintains habitat; prohibits wildlife hunting
	- **Significant co-benefits for local communities**
	  - **Increased income through tourism revenues provides alternate livelihood opportunity:** number of tourists increased from 400 to 3k over 2007-15; and income for CBET increased from US$6k in 2008 to US$151k in 2015. Total revenues from project from **2007-16 are US$300k**
	  - **Improved local community skills**: local community technical and financial skills developed to run the CBET more professionally
		

Economic effectiveness	- **High initial investment in relation to long term gains.** initial funding of **US$200k** provided by a private philanthropic foundation to set up and run the model. Project has started generating profits of around **US$20k/year** after 8-9 years of operation, which is just enough to cover costs - **High costs to develop local community capacity** to act as tour guides, lead trekking, camping, hosting hotel stays; and to run the CBET more professionally. However, this project made minimal infrastructure investments, given local communities owned the land rights to build guest houses[1] - **High potential to increase tourism revenues**, given project location (i.e. easily accessible by ferry; ideal destination for ecological adventure); and increasing appeal of locally run guesthouses, restaurants.[2] However, **quantum of tourism revenues are a function of**: (i) demographic profile of tourists (e.g. bag packers, niche high end customers, expats); (ii) visitor rate during the peak and off-peak season; (iii) willingness to pay	

[1] Two permanent WA staff are working on the field to coach local community to work in a more participatory manner

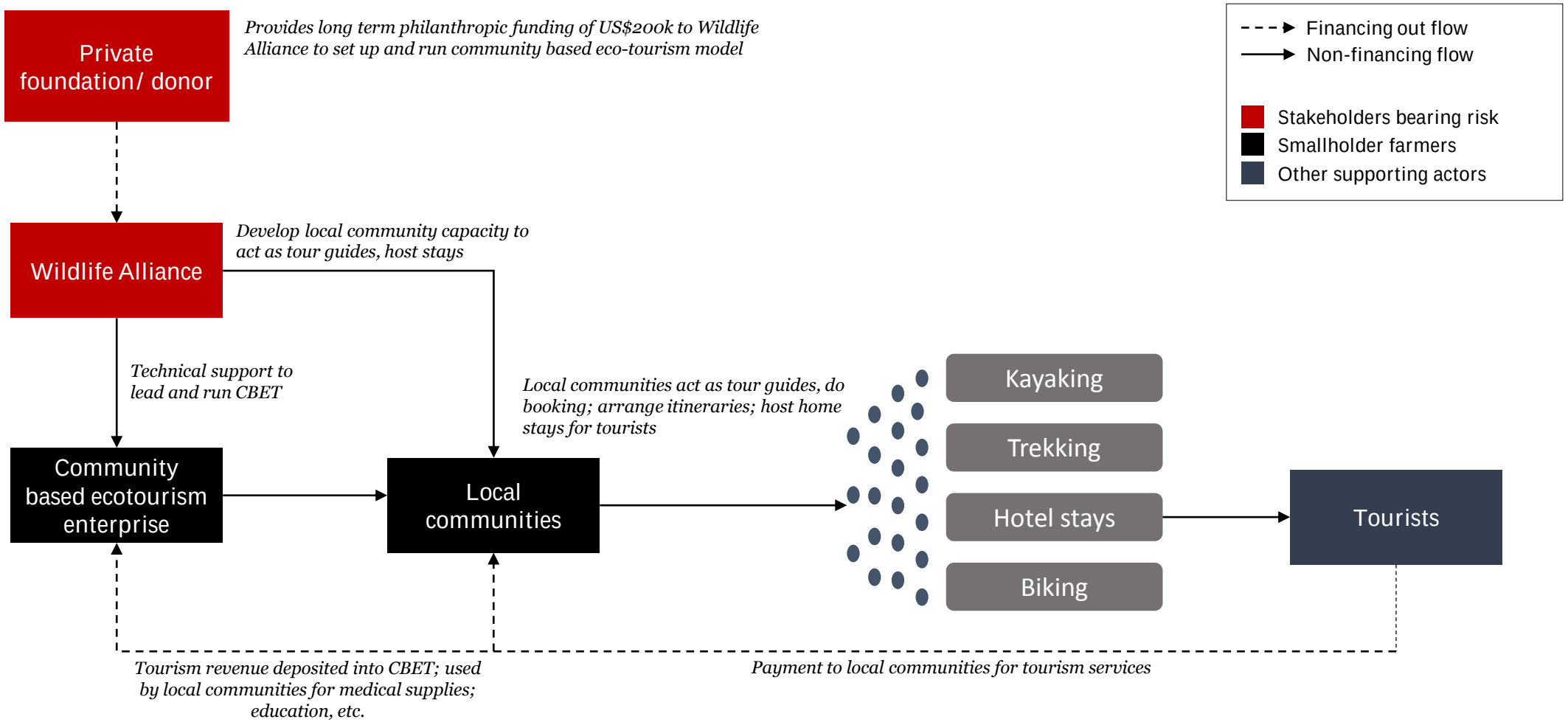
[2] The project site is located amid stunning mountains, rivers, rainforests, wetlands, mangroves and is home to w wide array of wildlife serving as an ideal destination for tourists. Revenues for model is also not reliant on wildlife viewing, which ensures greater stability of tourist revenue stream

Niche model with some potential for scalability to expand tour product offerings during the off-peak season, however, replication needs to be validated within local contexts

Criteria	Assessment	Scoring
Innovation and scalability	- **Mature model, with some potential for scalability**. Model is running at full capacity after 8-9 years of operation with large offerings for tourists - **However, some potential to expand tour product offerings** to increase visitor rate during the off-peak season; and target wider customer profiles (e.g. domestic customers from Cambodia) - **Replicability of model needs to be validated** within local context, and is contingent on multiple factors, such as area's natural attractions (attractiveness and feasibility of each location); ease of accessibility for tourists	◑
Other assessment factors	- **Strong partner network**. Wildlife Alliance is a large international conservation organisation, with the resources; capacity and network to implement large scale models effectively. Partnership with private philanthropic foundation lends greater financial credibility to the model. Strong support from Cambodia's Community Based Eco-tourism Network (CCBEN) for networking and marketing - **Strong support for eco-tourism from the Ministry of Environment (MOE) and Tourism Ministry in Cambodia**. Community based eco-tourism is promoted as a green business to preserve and protect natural resources and environment; and to generate greater income and jobs for communities - **Local communities own land use rights at project site**, which reduces governance/legal issues of dealing with local authorities	◕

Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Financial and non-financial flows

Strong multi-stakeholder collaboration among the local communities, Wildlife Alliance and the private foundation has resulted in successful functioning of the Chi Phat model



[1] Other eco-tourism models may include additional actors in the value chain, such as local authorities for land use permits/rights. Local communities in the Chi Phat area own the land, which reduces the need to engage with local authorities/government for land rights

Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Stakeholder drivers and challenges

Wildlife Alliance works closely with local communities to create greater ownership and ensure long term sustainability of the model

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
WILDLIFE ALLIANCE Direct Protection to Forests & Wildlife	**Capacity building** - Ongoing training of village communities to act as tour guides; arrange itineraries, oversee community ranger patrols; do accounting - Training to run the CBET as a professionally run enterprise - Monitor impact of local communities activities on reducing slash and burn, hunting, etc.	– **Large scale impact on wildlife conservation:** opportunity to reduce depletion of endangered wildlife and reduce deforestation on a large scale (e.g. reducing slash and burn) – **Improve livelihood of local communities:** local communities are trained to act as tour guides and offer other attractions to earn tourism revenues	– **Technical support to develop local community skills:** significant ongoing handholding for local communities to run the CBET and provide tourism services – **Awareness among local communities:** education and awareness building of local communities to shift from animal trafficking and poaching to tourism activities – **Significant long term investment** and unstable revenue stream contingent on visitor rate; willingness to pay – **Difficult to monitor impact:** monitoring impact on local community activities on reducing slash and burn, illegal hunting is challenging	– Build trust with local communities to create greater ownership of the model – Develop local community capacity to share cost and responsibility of training over the long term – Intensive marketing to raise awareness of the destination to attract more tourists – Diversify tour product offering to attract tourists during the off-peak season, and target a wider customer profile (e.g. domestic tourists from Cambodia)

Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Stakeholder drivers and challenges

Alignment with local community needs for alternate livelihood opportunities in the area was key to ensure strong community engagement and participation in the model

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Local communities/ villagers***	**Capacity building:** - Local community members form an enterprise to lead and run the CBET - CBET manages funds from tourism revenues, which can be used by members at their own discretion - Community members are trained to as tour guides to do booking; arrange itineraries; run home stays for tourists	– **Improved income:** alternate livelihood opportunities through tourism activities (e.g. as tour guides; running hotel stays) – **Improved skills and capacity**: receive training to improve technical and financial skills to run the CBET as a professional organisation	– **Technical support for tourism related activities**: ongoing handholding and training to run and manage the CBET professionally (e.g. managing tourism revenues) – **Alternate livelihood opportunities:** may require alternate livelihood opportunities to account for low visitor rate during the off-peak season – **Un-intended environmental impact:** increased waste, safety issues and other impact on environment with increasing influx of tourists	– Engage closely with WA to develop requisite skills to run the CBET effectively – Work with WA to expand service offering to attract tourists during the off-peak season to ensure stable revenues – Set up facilities to avoid negative impact of increasing tourism activities (e.g. rubbish disposal)

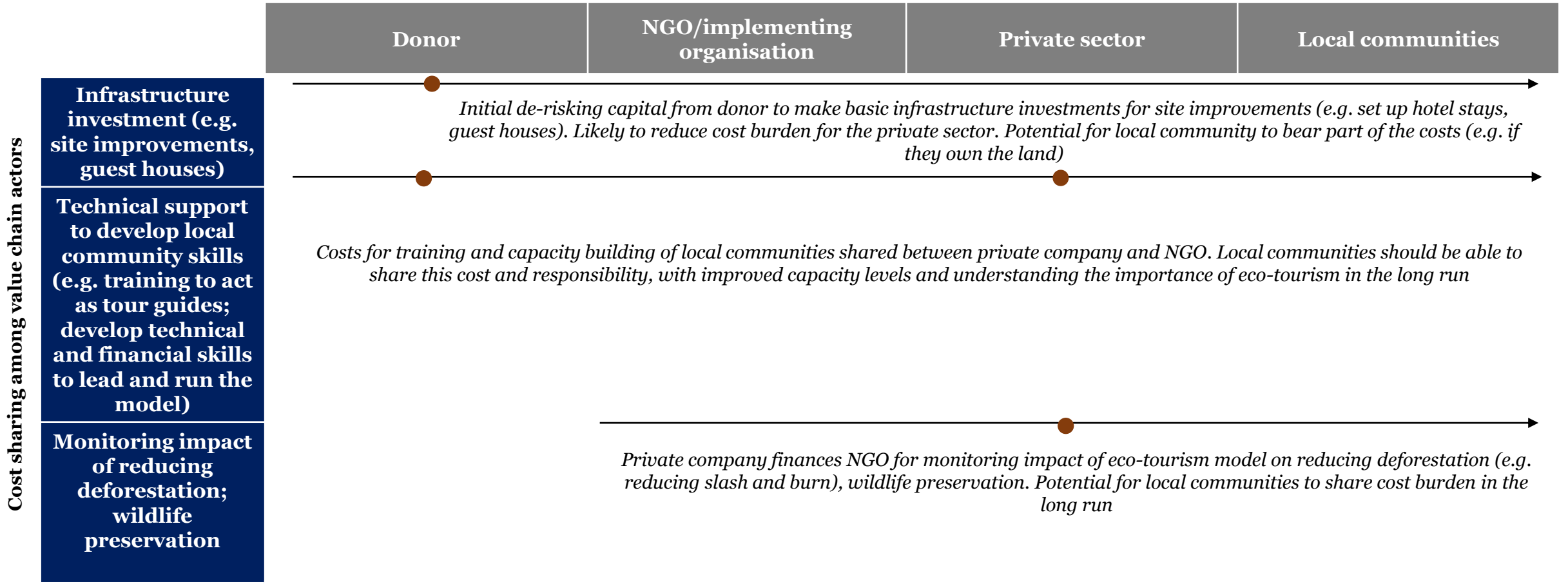
Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Stakeholder drivers and challenges

Initial long term funding from philanthropic foundation to set up project site and run the CBET, and minimal infrastructure investments have been key conditions to strengthen commercial feasibility of project

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
 ***Donor/ funder***	**Financing activities** - Private philanthropic foundation provided upfront funding of US$200k to set up and run the CBET eco-tourism model, with a long term pay back period	– **Alternative livelihood for local communities:** Foundation can create alternate income generating opportunities for local communities through tourism revenues – **Large scale impact on reducing deforestation:** tourism revenues intended to serve as an incentive for local communities to avoid engaging in illegal chopping, hunting, slash and burn	– **Significant long term investment:** high upfront investment to set up and run the model, with a long pay back period – **Measuring impact**: monitoring and evaluating impact of eco-tourism on reducing deforestation and improving local communities livelihood is difficult to measure – **Ongoing technical support:** requires ongoing training to develop capacity and skills of local communities to provide tourism services	– Potential to scale-up the model by diversifying service offerings to attract tourists during the off-peak period – Strengthen local community capacity to lead and manage the model with minimal support from WA over the long term

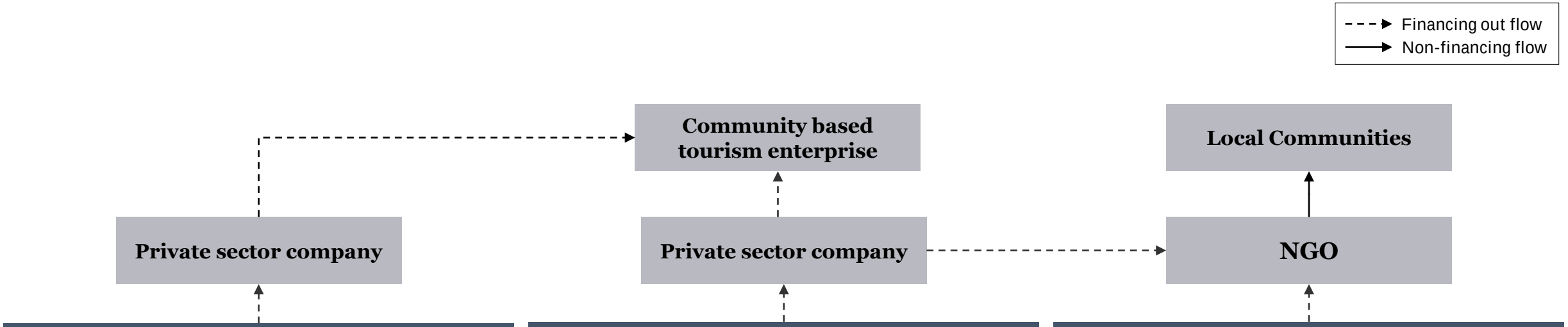
Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Cost sharing burden

Although long term donor support is necessary to set up and run the model, cost bearing responsibility should gradually shift to the private sector and local communities as the model is validated within the local context



Case study: Community based eco-tourism by Wildlife Alliance in Chi Phat, Cambodia: Potential support

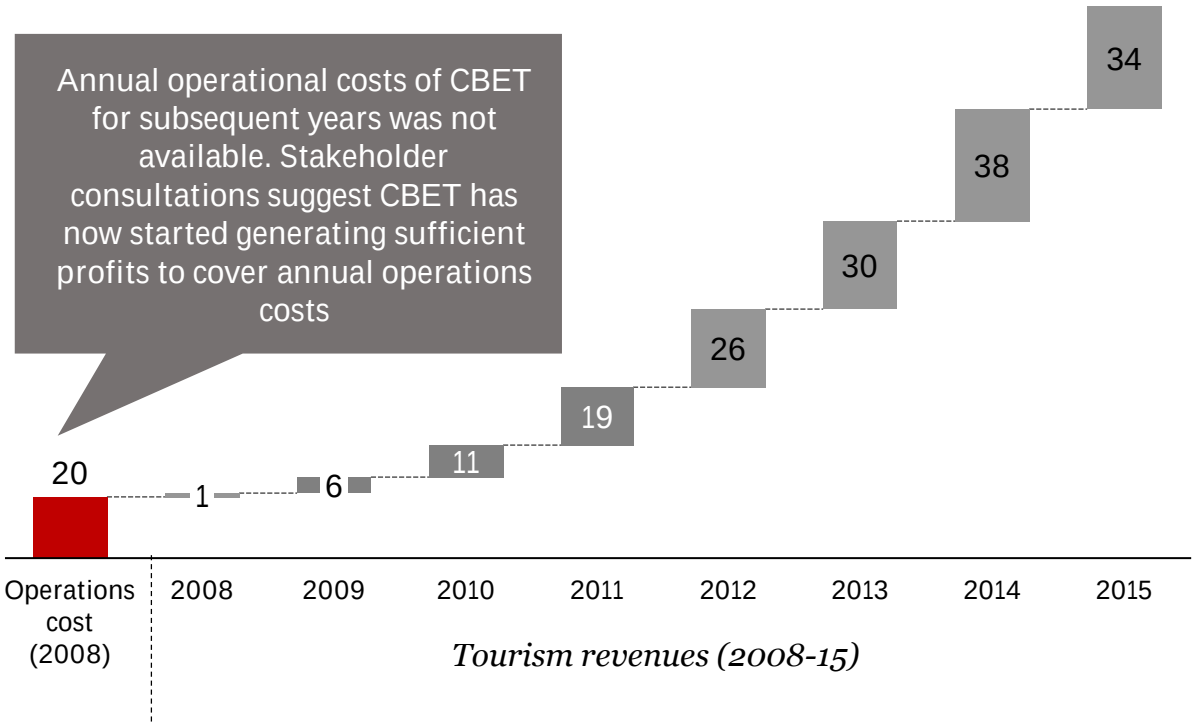
Donors and multilaterals can catalyse private sector investments in the programme by providing initial long term capital injection to finance cost of setting up and running the CBET



Role 1: Long term de-risking capital to set up and run the CBET	Role 2: Grant funding to scale-up existing model	Role 3: Short-term grant funding for capacity building
- **Initial capital injection** to finance cost of infrastructure (e.g. hotel stays/lodges), and initial cost of developing local community skills to run the tourism enterprise - May not be suitable for a private sector enterprise, given long pay back period. Potential to engage an **impact investment fund with a larger risk appetite**	- Grant funding to **expand service offering to increase visitor rates during the off-peak season**; and target a wider profile of tourists (e.g. domestic tourists in addition to expats and international tourists) - This is likely to increase tourism revenues and improve commercial feasibility of the model in the long term	- Grant funding to **finance capacity building programme** provided to local communities (e.g. to run the CBET more professionally; act as tour guides, etc.), by a partner NGO (or other stakeholder)

The Chi Phat eco-tourism model was fully supported by philanthropic funding for 8-9 years, but is slowly moving towards greater operational profitability

Costs and revenues for Chi Phat CBET model [1]
US$ '000s



The project has been largely supported by philanthropic funding, given low initial tourism revenues…

- High initial investment: initial investment of US$200k from private philanthropic foundation to set up and run the CBET
- High operations costs: operations costs for first year were US$20k. Potential for these costs to increase over the years as CBET grows to include more members and offer improved services. Other costs include training local communities to act as tour guides, running hotel stays, etc.
- Low tourism revenues in initial years: stakeholder consultations suggest that revenues from tourism were insufficient to cover operations costs for 8-9 years

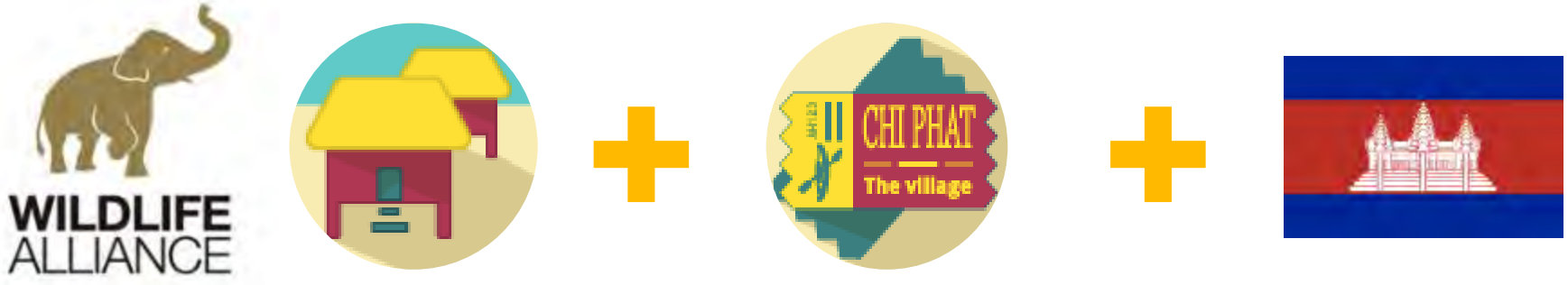
…but is slowly moving towards operational profitability, with expanded tourist offerings

- Expanded tourist offering: programme has now started generating enough revenues to cover costs of operations. Programme is also targeting increased tourism revenues by expanding tourist offering to increase visitor rate during the off-peak season.
- Reduced training costs: potential for training costs to reduce over the years, as local communities upscale their skills to act as tour guides, and run the CEBT more efficiently

[1] Data provided by the Wildlife Alliance

Annexure

BUSINESS CASE# 11
CHI-PHAT ECOTOURISM



NGO **COMMUNITY-BASED ENTERPRISE** **ECO-TOURISM** **CAMBODIA**

BUSINESS MODEL

- Wildlife Alliance invests in establishment and training of eco-tourism community enterprise in Chi Phat
- To provide profitable alternative livelihood from ecotourism and discourage wildlife hunting, and implicitly SAB

USAID FROM THE AMERICAN PEOPLE Dalberg

BUSINESS CASE# 11
CHI-PHAT ECOTOURISM

MITIGATION POTENTIAL

ACTIVITIES	DESCRIPTION	ER ESTIMATES (tCO2e/ha/yr)		
		AVERAGE	LOW	HIGH
AD	• Protect 720,000 ha of tropical forests from illegal loggers, commercial and industrial encroachment • Forest burning has stopped 100%	42.7	NA	NA

BUSINESS CASE# 11
CHI-PHAT ECOTOURISM

MITIGATION POTENTIAL

ACTIVITIES	ER ESTIMATES (tCO2e/yr)
	AVERAGE
AD	42.7

AREA (ha)	ER ESTIMATES (tCO2e/yr)
	AVERAGE
Scenario 1: 100% 100,000	4,270,000
Scenario 2: 30% 30,000	1,281,000

- Scenario 1
  Assume that Chi Phat ecotourism generates sufficient revenues to encourage and monitor the protection forests in 100% of Chi Phat area
- Scenario 2 (conservative)
  Assume that Chi Phat ecotourism generates sufficient revenues to encourage and monitor the protection forests in 30% of Chi Phat area
- Leakage is expected to be minimal
- Using IPCC and FAO estimates for mitigation measure and potential for calculation

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BUSINESS CASE# 11
CHI-PHAT ECOTOURISM

CO-BENEFIT

	CRITERIA	ACTIVITY
	Soil quality	Protection of forests could reduce potential erosion and protect mineral soil from exporsure
	Water quality	Forest conservation could reduce erosion potential and subsequent sedimentation of water bodies
	Biodiversity	• Protection of forest results in tree species diversity and maintenance of habitate structure • The program prohibits wildlife hunting

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Knowledge brief #12

Technology, applications and systems to support GHG emissions reduction

Production of biochar to improve soil quality and restore degraded lands

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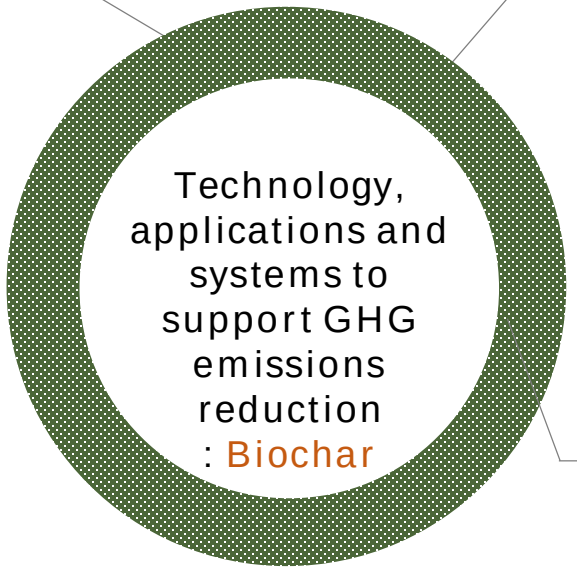
Philippine Biochar Association (PBiA) is partnering with smallholder farmers and traders to produce biochar for mine rehabilitation and other reforestation end-uses

Biochar aggregator wants to profitably aggregate biochar products and sell to market

- Potential solution: Biochar aggregator provides TA to farmers to produce biochar products. It aggregates the products and sells to market
- Challenges:
  - *Requires upfront investment:* Initial capital required ($600K) for requisition of land, construction of biochar facility, development of equipment for high-grade biochar processing
  - *Credible off-taker and market:* Lack of favourable market conditions due to low awareness or guaranteed buyer disincentives investment. Constant pressure required from government for mining companies to invest in reforestation activities



Mining companies need to rehabilitate degraded lands surrounding closed mines due to government mandate

- Potential solution: Biochar can be a cost-effective method to reforest mined-out or other degraded areas
- Challenges:
  - *Training required:* Will require initial effort to understand and use the new technology
  - *Advanced payments:* Require to provide advanced purchase guarantees to incentivise investment in biochar production

Smallholder co-operatives want to increase income

- Potential solution: Smallholder cooperatives work with farmers to produce biochar products and sell to private company
- Challenges:
  - *Limited awareness:* Difficulty convincing farmers to produce a commodity they have heard little about
  - *Training:* Training required to produce biochar products

The model has potential for impact as production of biochar reduces GHG emissions, however significant efforts will be required for increasing awareness for it to be commercially feasible and reach scale (1/2)

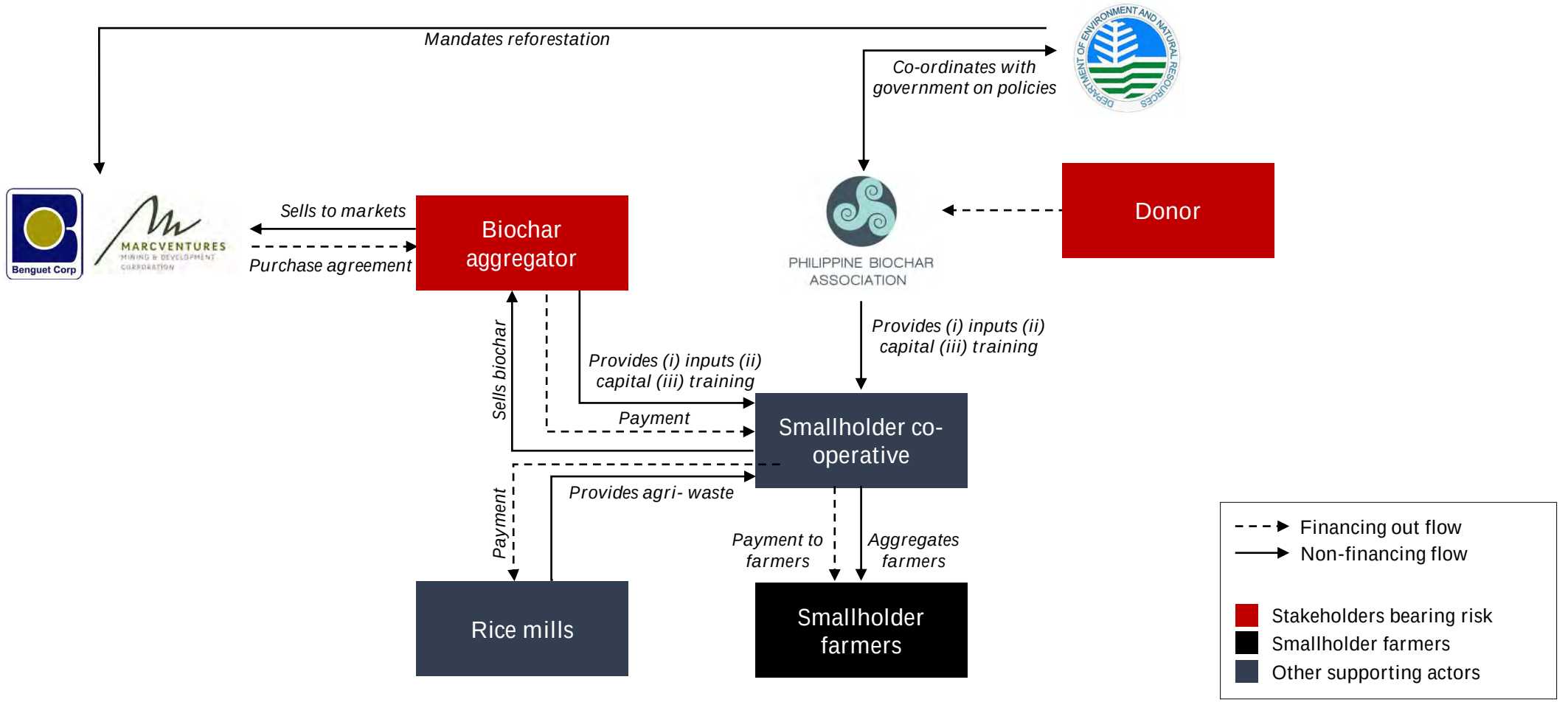
Criteria	Assessment	Scoring
Impact potential	- Potential for high GHG emissions reduction in agricultural and reforestation uses o Adoption of biochar as a nutrient source as it can reduce the need for chemical fertilisers. Boosts soil fertility; prevents soil erosion; improves soil quality by raising soil pH; traps moisture, attracting more beneficial fungi and microbes; helps the soil hold nutrients; and improves water quality by retaining agrochemicals o One ton of biochar sequesters 3.67 tons of CO_2, and when used in rice land, 4-5 tons of nitrous oxide and methane are prevented from release in each cropping. Sustainable biochar implementation could offset a maximum of 12% of anthropogenic GHG emissions on an annual basis (1.8 $PgCO_{2e}$/yr). Over the course of 100 years, this amounts to a total of roughly 106 metric tons of CO_2-equivalents[1]. - Significant co-benefits: increase in job creation for farmers and increased incomes. Rehabilitated lands can also potentially be used for productive purposes in the future	●
Economic effectiveness	- Low production costs to produce biochar that include micro scale (biochar cook stoves) to village level systems (smaller scale) which will promote adoption of biochar. However, high quality, large scale units can utilise agricultural waste to produce biochar to act as good soil amendments and are better quality (25PHP/ kg for high grade biochar, compared to 2.50PHP/kg for biochar produced from rice husk) - Low breakeven period as set-up costs are c. $600K, which can be covered up in a little more than an year. This will incentivise financial institutions to invest money in biochar facilities given payback in less than 2 years - However, there is no track record as biochar has recently been introduced in developing Southeast Asian countries. Globally, biochar technology is still nascent and has only recently begun to gain traction; in 2015, there were around 350 active biochar companies, as compared to less than 100 just 3 years ago[2]	◑

[1] Woolf et al, 2010; [2] Biochar International Organisation

The model is innovative with a positive enabling environment helping it to reach scale when coupled with activities required to increase awareness

Criteria	Assessment	Scoring
Innovation and scalability	- Several potential markets can be found for biochar products in the environmental, mining, construction and agricultural sectors. It can be used in agriculture as a soil conditioner, in livestock farming as a feed supplement and in metal working as a reducing agent - High potential for scalability of biochar as biochar can be produced from low cost, open-source technology ranging from micro to village level. These technologies require low initial capital and little training to be able to use - Limited potential for scalability for high-grade biochar– Requires high capital investment for land requisition, construction of biochar facility limiting ability to scale quickly. Significant donor and government support will be required to set up high-grade biochar industry in the country - Nascent and innovative business model- No proven success and limited awareness makes the investment extremely risky. However, if model succeeds there is high potential to create significant impact and can be a leading agent for change	
Other assessment factors	- Favourable enabling environment facilitates stakeholder engagement: Support from the new administration and the Philippine Rice Institute for the promotion of biochar usage for reforestation. The Minister of Environment in the new administration is focused on mandating reforestation efforts by mining companies, who have already started adopting biochar for their reforestation efforts. However, even with the strong support from the new administration, biochar has not fully permeated the agricultural sector - Existence of credible/capable partners: Philippine Biochar Association is committed to increasing the use of biochar and setting up a private facility for aggregation and sale of products - International support available for organisations and companies worldwide to adopt biochar and understand the processes and technologies related to its production.	

Successful implementation lies in incentivising mining companies to undertake reforestation and for a biochar organisation to provide training and market access to biochar producing smallholders



The underlying business driver for the private sector is to increase revenue by selling biochar products whereas the Philippine Biochar Association is focused on reducing GHG emissions and increasing awareness of biochar

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
PHILIPPINE BIOCHAR ASSOCIATION	- Capacity building - Technical supervision - Aggregate smallholders	- Promote adoption of biochar by installing community-based enterprises engaged in the production of "high-grade biochar" made with customized machinery and equipment Reduce GHG emissions by promoting the adoption of biochar	- Change in administration can alter incentives and not mandate mining companies to reforest - Market awareness does not improve limiting off-takers from demanding products - Smallholders show no interest in producing biochar products	- Maintaining government partnership and support for the promotion of biochar products - Requesting advance purchase agreements for biochar
PHILIPPINE BIOCHAR ASSOCIATION Biochar aggregator	- Access to markets - Aggregating production	- Increase revenue by sale of biochar product to different markets	- Limited awareness of biochar will inhibit adoption of biochar products curbing scale - High costs associated with training manpower capacity to ensure the sustainability of community enterprises - Initial upfront investment required for (i) land requisition (ii) biochar facility and equipment (iii) microbes	- Engaging PBiA and other international organisations' to promote awareness - Securing upfront funding from donors for setting up of biochar facility and equipment - Partnering with NGO to assist with training and capacity building for smallholders - Working with farmer cooperatives to reduce transaction costs

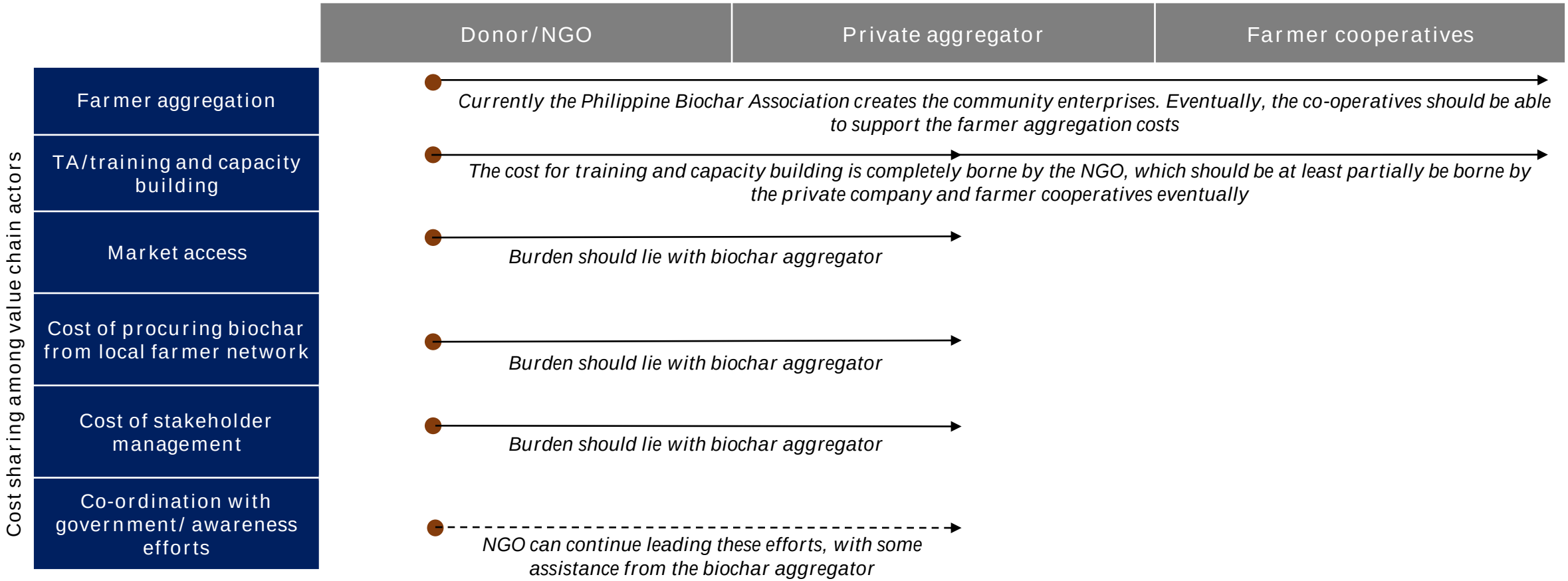
Mining companies have a reforestation mandate for which they are using biochar; government is supporting to increase awareness of biochar to be able to create large scale impact

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Benguet Corp MARCVENTURES MINING & DEVELOPMENT CORPORATION Mining company	- Purchase biochar products - Undertake reforestation projects	- Complete reforestation mandate by using biochar products in mined out areas while significantly reducing GHG emissions	- Biochar is not effective and additional resources are also required for reforestation - Difficult to produce biochar in enough scale required to fulfill the reforestation mandate - Monitoring and evaluation is a challenge since KPIs and other evaluation metrics have not been fully understood	- Working with NGOs to improve capabilities and training for smallholders - Mining companies/ off-takers can help invest and finance biochar production
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES Government	- Identify reforestation areas - Mandates reforestation	- Large scale impact on increasing sustainably managed forest cover - Promoting adoption of biochar to have significant reduction in GHG emissions through biochar products	- High upfront investment in time and money to increase awareness of biochar products	- Work with international organisations and governments to help increase awareness of biochar globally and in-country

Rice mills have an opportunity to sell agricultural waste to biochar producing companies; smallholder farmers have additional means to increase incomes

Stakeholders	Activities	Key business drivers	Key risks and challenges	Risk mitigation strategies
Rice Mills	- Provides input supplies	- Sell agricultural waste and receive revenue for something that has no value otherwise	- Identifying buyers can be challenging due to the nascent biochar industry	- Biochar association can reach out to the rice mills and give advance agreements depending on the biochar being produced
Smallholder co-operatives	- Aggregate farmers - Produce biochar products	- Job creation and increase in income for farmers as they sell biochar products to private company - Improve in productivity for farmers utilizing biochar in their agricultural activities - Significant support received from the Philippine Biochar Association in the form of training, market access, capacity building etc.	- Limited awareness of biochar will inhibit adoption and sale of biochar products - Difficult to aggregate farmers as they might be unwilling to be part of something they have heard nothing about	- Philippine Biochar Association to provide continuous support to increase awareness and provide market access for biochar products - PBIA also assisting in forming community enterprises and educating farmers on how to produce biochar and its benefits

Although initial donor support is necessary, the cost bearing responsibility should gradually shift to the private sector as awareness of biochar products and its impact increases



Donor and multilateral agencies can catalyse private sector investment in the biochar industry by providing initial capital and training through the Philippine Biochar Association

Philippine Biochar Association

Role 1: Develop market awareness and incubate SMEs in biochar products

- Support to increase awareness of biochar by promoting low-cost technology options to adopt biochar in micro and village level scale
- Help identify suitable companies that wish to compensate for their deforestation activities
- Support Philippine Biochar Association to develop a business plan for biochar production that will eventually catalyse other private sector investments in this space

✓ Directly catalyses private sector investment

✗ Grant money; will not receive direct returns from investment

Role 3: Grant funding for capital expenditures for initial projects

- Provide grant funding to PBiA to finance initial capital expenditure ($600k) for requisition of land, construction of biochar facility etc. Provide grant funding for initial training requirements to understand technology available globally
- Purchase agreements and sale of biochar products can be used to cover operational costs ($45,000) by the private company and farmer cooperatives

✓ Help produce large number of products and reach scale

✗ Grant money; will not receive direct returns from investment

Role 2: Provide short term loans/ guarantees

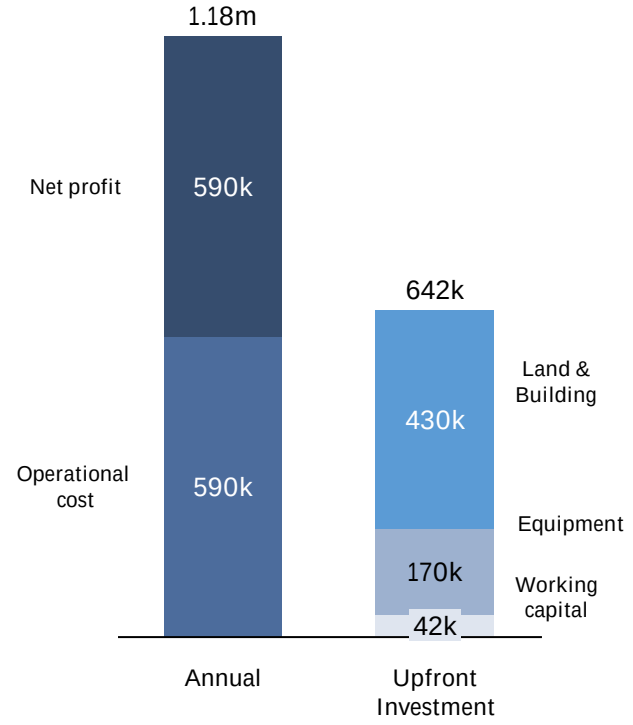
- Support to raise capital by other private investors/institutions to invest in biochar by providing de-risking capital for any loss to investors
- Incentivise off takers (mining companies) by putting in initial money for purchase agreements that can be paid by off-takers on delivery of product

✓ Potential to include the off takers and banks to share some costs

✗ Slow process giving low level of biochar awareness

PBiA estimates c.50% net profit margins and payback on investments within 2 years of outlay, which will be key in developing the biochar industry

Costs and profit margin for a biochar facility[1]
US$



Low upfront costs and strong margins lead to short payback periods…

- Upfront investment is low: requires c. $600K for land, equipment and initial working capital requirements
- Strong net profit margins of c. 50%
- Low breakeven period as estimated annual revenues can cover initial upfront investment in 1-2 years

…but downside risk of market assumptions may reduce returns

- Production facility is working at full capacity to receive the projected revenues of $1.18M annually
- Market demand is high for companies to be able to off-take complete production of goods
- Training costs are not included in the current operational costs and these might be a large expense

[1] Numbers are estimates provided by PBiA
Assumptions: 270 working days of biochar facility have been incorporated in the model; Exchange rate of $1=46PHP is used for the projection conversions; Throughput is estimated to be 20 tons per day; Wholesale selling price is estimated at 10 PHP/ kg

Although participants do not see long-term viability of biochar, the working group highlighted the importance of technologies in facilitating the implementation of business models[1]

The working group did not believe that biochar could be commercially feasible…

- *Lack of evidence of commercial feasibility globally:* Participants believed there are almost no examples of commercially feasible biochar projects globally reducing confidence in the project
- *Lack of business plan for PBiA:* Absence of a well-developed business plan by Philippine Biochar Association made investors wary of trusting the association with their financials, expertise or motivation
- *Data on impact is still not established:* Participants required more concrete evidence of impact as currently there is insufficient data on impact of biochar and how it can contribute to carbon reduction in Southeast Asia

…however the participants see the importance of the supporting technologies as means to facilitate importance of other business models

Reduce transaction cost	Transaction costs can be reduced by integrating supply chain activities for smallholder farmers. For example, ICT (Information Communication Technologies) helped reduced information search cost by 33% by providing farmers with a mobile phone instead of them traveling to reach information[2]
Reach more people/ aggregation	Technology can help aggregate smallholder farmers. E.g. branchless banking helps reduce transaction costs and allows farmers to be financially included. Virtual aggregation is allowing businesses to register farmers, manage contracts, provide extension services, make payments, identify best practices. Olam adopted Vodafone's Connected Farmer System in Tanzania (2015), and reached 30k farmers across hundreds of kms to be organized in a single platform
Big data processing	Gathering data on practices and initiatives, can help monitoring and evaluation of sustainability practices. Private sector has also shown interest in paying for data that will help back-up their investment decisions in agriculture. Farmers can maintain records making them more attractive customers for financial institutions

[1] Input solicited from working group participants at USAID/RDMA-organised event in Bangkok on 26 September 2016
[2] Studied by Silva and Ratnadiwakara (2008) on small-holders in Sri Lanka

Annexure

CASE # 12
BIOCHAR

PHILIPPINE BIOCHAR ASSOCIATION

NGO (and spin off SME)

PHILIPPINES

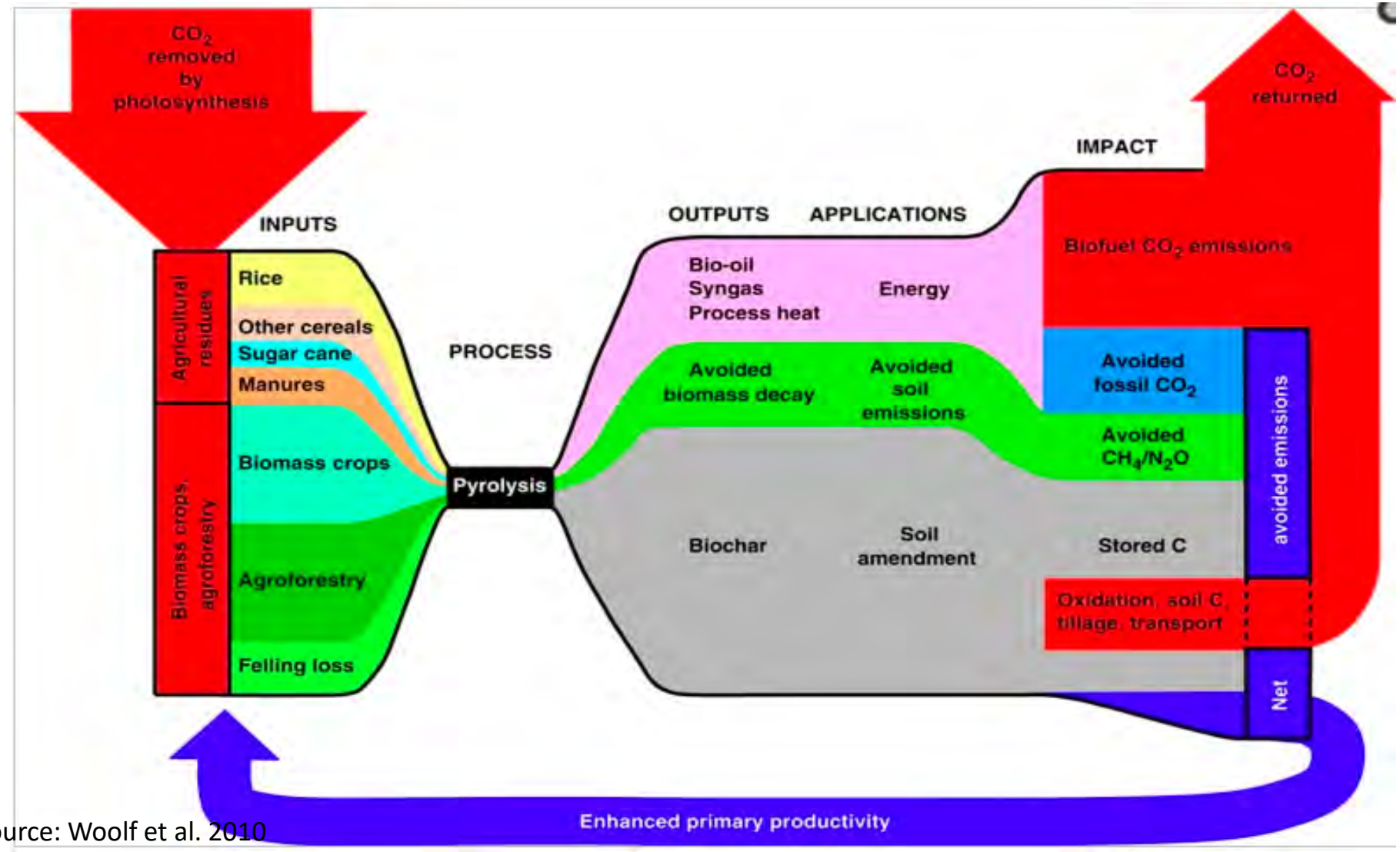
PHILIPPINES

BUSINESS MODEL

- PBiA aggregates and provide training to farmers in biochar benefits and production with funds received from clients (mining companies)

- To generate profit from sale margins

CASE # 12
BIOCHAR



Source: Woolf et al. 2010

CASE # 12
BIOCHAR

CRITERIA	ACTIVITY
Productivity	Crop productivity has on average been enhanced by 15% near-term but with a wide range of effects
Soil quality	Reduced soil erosion, retention of soil moisture, maintenance of proper soil pH, improved nutrient holding and nutrient efficiency
Water quality	Agrochemicals are retained in biochar, resulting in less water pollution
Income from alternative livelihood	Payment for biochar, which otherwise would be agricultural waste