



# CASA

Commercial Agriculture for Smallholders and Agribusiness

**Principles for designing impactful cocoa sustainability projects**  
*Lessons learned from FCDO Carbon Finance Study on Cocoa in Ghana*

# Agenda

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## 0. Executive Summary

### 1. Context

### 2. Principles

### 3. Case study



# Executive Summary

## Chocolate companies have made little progress on sustainability goals



**Cocoa farmers continue to live in poverty**



**Deforestation persists**



**Marginal reductions in Scope 3 emissions**

## Current farmer training and agroforestry programs are not driving results

*A 2019 Cocoa Action report noted a **23% adoption rate** of pruning at project endline.<sup>1</sup>*

*A 2019 study of tree planting programs in Côte d'Ivoire found distributed **tree survival was less than 2%**<sup>2</sup>*

## Supply shortages and EUDR compliance increases pressure and urgency to improve support to smallholder farmers and transform cocoa production

## Five principles for designing impactful cocoa sustainability programs

- 1** *>> Define objectives*  
**LINK INCOME AND DECARBONIZATION OBJECTIVES**
- 2** *>> Prioritize activities*  
**START WITH THE FARMER BUSINESS CASE**
- 3** *>> Drive behavior change*  
**ADDRESS UNDERLYING BARRIERS PROHIBITING FARMERS FROM ADOPTING BEST PRACTICES**
- 4** *>> Measure and learn*  
**ESTABLISH STANDARD OUTCOME-LEVEL KPIs AND MEASUREMENT SYSTEM TO DRIVE CHANGE**
- 5** *>> Bring in stakeholders*  
**ALIGN INCENTIVES ACROSS VALUE CHAIN**

1. World Cocoa Foundation, Cocoa Action Report 2019. 2. Sanial 2019

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# Despite significant investment over the past decade, the cocoa industry has not made progress on its sustainability objectives

Chocolate companies and traders invested \$125 million in sustainability programs

Total estimated sustainability funding by top chocolatiers from 2010-2020<sup>1</sup>



Yet little progress has been made on key objectives



**Cocoa farmers continue to live in poverty**  
76% of cocoa farmers in Ghana do not earn a living income<sup>2</sup>



**Deforestation persists**  
10x increase in agricultural encroachment in Ghanaian forest reserves since 2010<sup>3</sup>



**Marginal reductions in Scope 3 emissions**  
Only two chocolatiers report reductions in Scope 3 emissions<sup>4</sup>

1. 2020 Cocoa Barometer and World Cocoa Foundation, 2. Cocoa Life, 2019 3. Tropenbos International and Mighty Earth 4. Hershey's and Barry Callebaut publicly reported Scope 3 emissions reductions in 2022/2023 progress reports. Based on TechnoServe review of publicly available sustainability reports.

# Large investments in farmer training and agroforestry projects are not achieving results

Chocolate firms have **trained over 678,000 thousand farmers** in Good Agricultural Practices in Ghana<sup>1</sup>

And they have distributed **33 million tree seedlings** across Ghana and Cote d'Ivoire<sup>1</sup>

...with little evidence of improvement in practices



A 2019 Cocoa Action report noted a **23% adoption rate** of pruning at project endline.



After 5 years of implementation, Cocoa and Forests Initiative results do not report on GAP practice adoption



**“Cash and labour constraints as well as inadequate input delivery by the government affected the adoption of good agricultural practices”**

–Lindt “Lessons learned from payments for ecosystems services”<sup>2</sup>

...with unclear results on long-term adoption of agroforestry



A 2019 study of tree planting programs in Côte d'Ivoire found distributed **tree survival was less than 2%**<sup>2</sup>



**“A pervasive issue has been seedling mortality once they have been planted in the farms.”** – Mondelez 2022 Cocoa and Forests Initiative Report

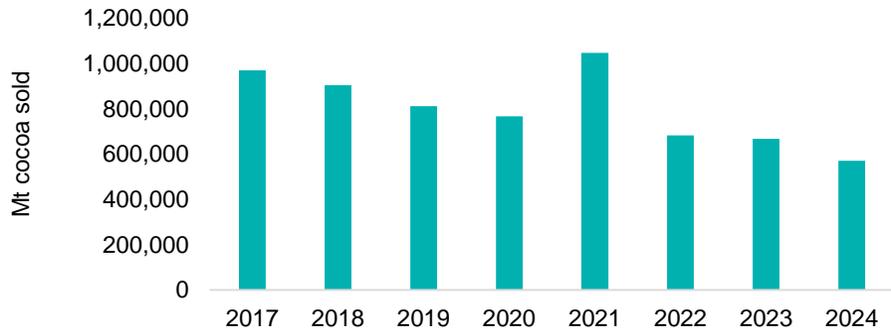


**“Efforts were focused on distributing shade tree seedlings to farmers. However, without adequate support, these seedlings were at risk of not being properly planted and had a high risk of mortality.”**  
– Barry Callebaut, “Lessons learned from payments for ecosystems services”<sup>3</sup>

1. World Cocoa Foundation, Cocoa and Forests Initiative 2018-2022 results, Ghana and Cote d'Ivoire. 2. Sanial 2019, 3. Swiss Platform for Sustainable Cocoa, Unlocking Innovation Results and learnings from 15 value chain project 2022

# Supply shortages and EUDR compliance increases pressure and urgency to improve support to smallholder farmers and transform cocoa production

## 41% decline in cocoa production in Ghana from 2017 to 2024<sup>1</sup>



## Compounding challenges threaten production long-term



### Climate change

Leading to longer dry, hot periods that reduce soil moisture



### Increased spread of Cocoa Swollen Shoot Virus (CSSV)

Estimated to contribute to 17% loss in cocoa production annually<sup>2</sup>



### Expansion of illegal mining

- Youth choosing mining jobs over farming
- Farmers unable to access affordable farm labor
- Cocoa farmers giving up plots to illegal miners
- Widespread deforestation

## EUDR REQUIREMENTS

- 1 Products do not originate from recently deforested land
- 2 Products have been produced in accordance with relevant legislation of the country of production
- 3 Comply with respect of human rights



Photo of deforested land from illegal mining in Western Ashanti region of Ghana, courtesy of TechnoServe

<sup>1</sup> COCOBOD sales data. <sup>2</sup> Dr. Kwame Owusu-Anash, National Coordinator, COCOBOD

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# Five principles for designing holistic and effective cocoa sustainability programs

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- 5** *>> Align incentives*  
**DEVELOP LONG-TERM SUPPLY CHAIN PARTNERSHIPS**

# Linking decarbonization and income objectives increases impact and creates operational efficiencies

## Chocolatier invests in siloed projects

### Inefficiencies

#### Carbon

- ✗ Misses out on additional carbon intensity reduction through increased yields
- ✗ Ignores impact on farmer income

#### Operational

- ✗ Duplication of resources
- ✗ No cross-project coordination
- ✗ Farmer receives guidance from multiple sources

#### Income

- ✗ Misses out on income benefits of agroforestry and PES systems
- ✗ Ignores carbon benefit from GAP adoption

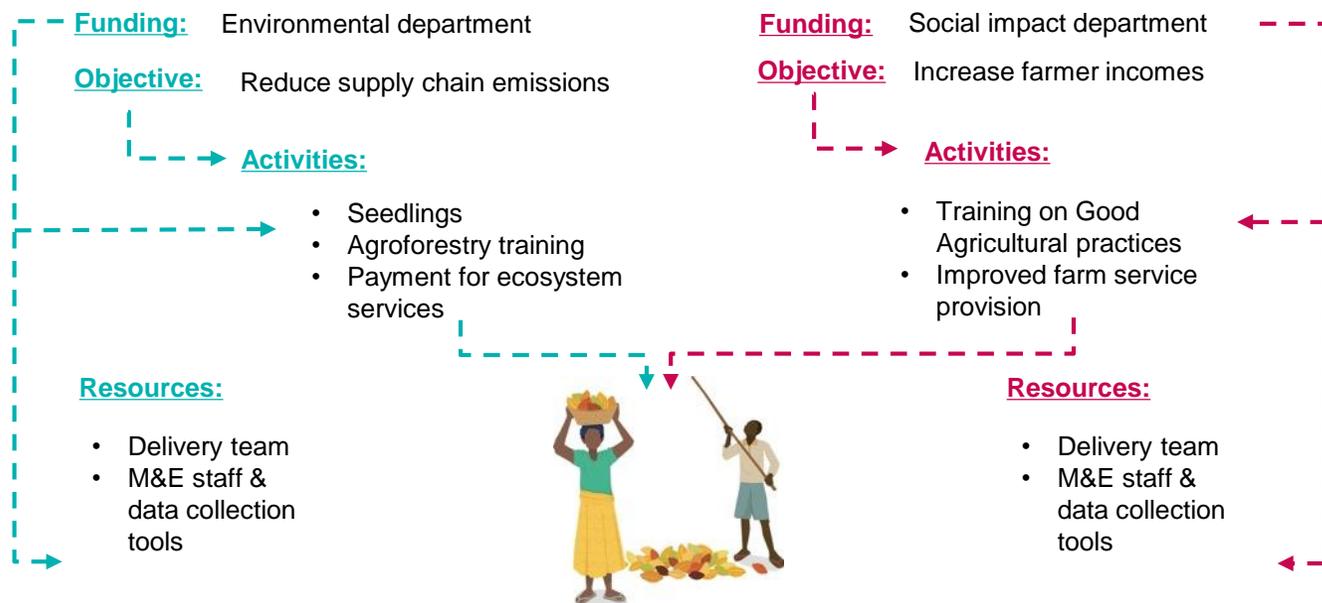
## Chocolatier invests in holistic project

### Benefits

- ✓ Increased overall project ROI
- ✓ Leverages funding from multiple departments to cross-subsidize impact
- ✓ Exploits synergies across project activities
- ✓ Creates operational efficiencies

### CARBON PROJECT

### INCOME PROJECT

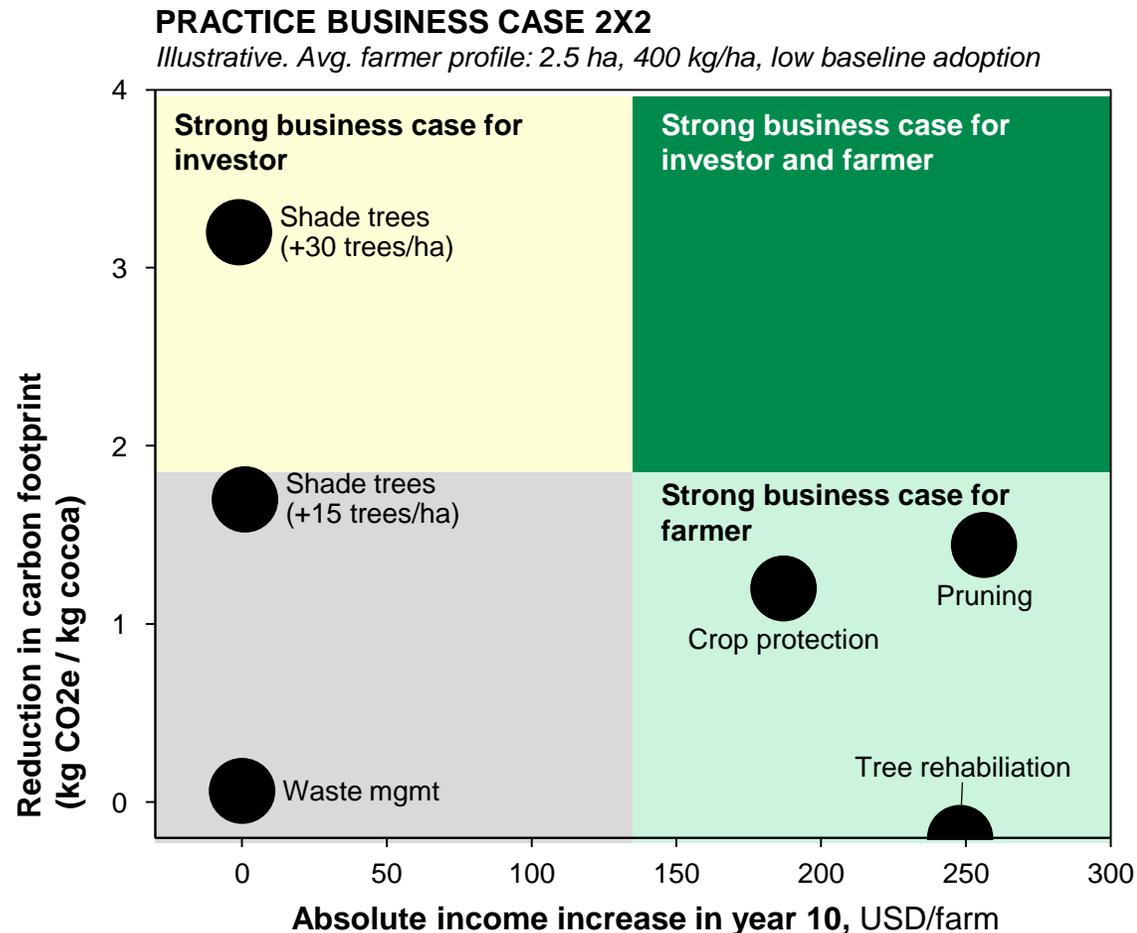


### DUAL-OBJECTIVE PROJECT



# Starting with the farmer business case enables the project to identify and prioritize high-impact activities

Analyze the impact of specific farming practices in terms of emissions mitigation and farmer income



## Key Takeaways



There is no singular practice that drives significant decarbonization and farmer income growth. Projects with dual income and decarbonization objectives must include activities in the top left and bottom right quadrants.



Specific good agricultural practices, like pruning and crop protection, drive highest income benefits for farmers.

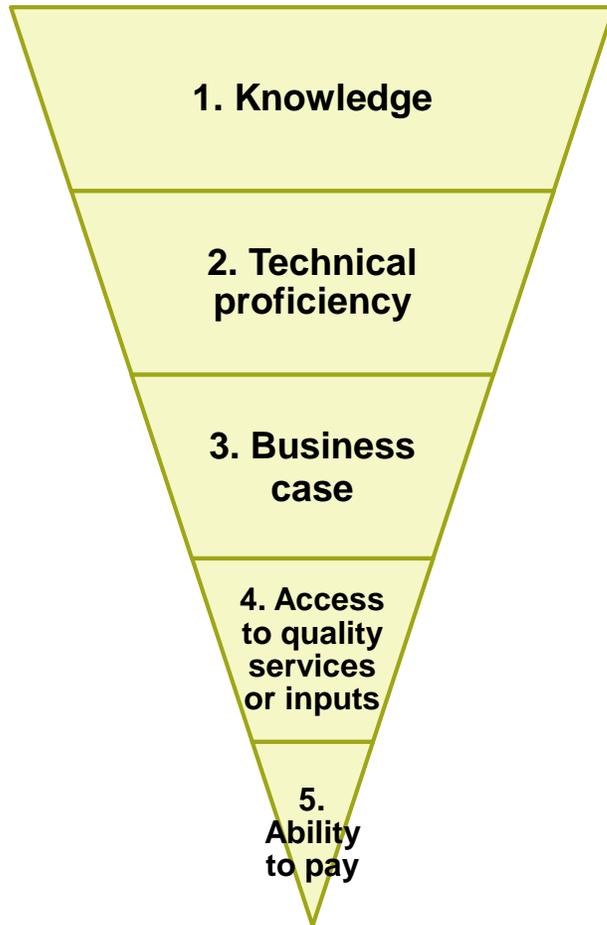


While there is a case for chocolatiers to invest in agroforestry, projects must include additional incentives to create an immediate business case for the farmer to adopt and maintain shade trees. Farmers will experience additional biodiversity and climate resilience benefits in long term.

1. Includes relative reduction through increased yields and absolute reduction through GAP adoption (e.g., fertilizer production & use) – carbon sequestration potential of shade trees assumed to be 70-80 kg CO2e/year/tree; 2. Carbon intensity reduction depends heavily on adoption of other GAP, e.g., fewer GAP adopted leads to higher impact of shade trees, average if ~2kg considered. Source: TNS analysis, South Pole

# To drive lasting behavior change, projects need to address challenges beyond farmer knowledge and technical proficiency

## STEPS TO UNLOCK FARMER ADOPTION



### Farmer training only partially addresses barriers to adopting pruning

### Seedling distribution does not address all agroforestry barriers

<p><b>1. Knowledge</b></p>	<p>✓ Farmers aware of what quality pruning looks like and why it is important</p>	<p>✓ Farmers trained on benefits of adoption.</p>
<p><b>2. Technical proficiency</b></p>	<p>✓ Field training enables farmers to practice skills, but some farmers too old or physically unable to prune well</p>	<p>✓ Farmers supported on species selection and tree spacing/density.</p>
<p><b>3. Business case</b></p>	<p>✗ Farmers need business coaching to understand ROI</p>	<p>✗ Agroforestry does not provide immediate or large impact on yield and income.</p>
<p><b>4. Access to quality services or inputs</b></p>	<p>✗ Quality pruning requires tools and physical ability. Young, trained service providers best fit for delivering quality</p>	<p>✓ Seedling distribution provides only a <b>short-term solution</b> for access to inputs and ability to pay by providing seedlings for free.</p>
<p><b>5. Ability to pay</b></p>	<p>✗ Poor cash flow prohibits many farmers from having up-front cash to pay for services</p>	<p>✓</p>

# To achieve sustainability goals, the industry needs to measure more specific outcomes

Common KPIS	Why they are not effective
 # farmers trained	<ul style="list-style-type: none"> <li>Does not capture practice adoption</li> <li>Encourages maximization of reach</li> </ul>
 # farmers adopting GAPs	<ul style="list-style-type: none"> <li>Does not measure which GAPs are adopted</li> <li>Encourages investment in training without prioritization of most impactful GAPs</li> <li>Does not measure quality of adoption</li> </ul>
 # tree seedlings distributed	<ul style="list-style-type: none"> <li>Does not capture tree survival</li> <li>Not able to estimate carbon sequestration</li> <li>Encourages investment in broad seedling distribution</li> </ul>
 # hectares under agroforestry	<ul style="list-style-type: none"> <li>No standard definition of agroforestry</li> <li>Does not enable measurement of carbon sequestration</li> </ul>

Recommended KPIS	Why they are effective
 # hectares with quality pruning (level 7 on quality scale of 1-10)	<ul style="list-style-type: none"> <li>Measures pruning adoption</li> <li>Specifies degree of quality</li> <li>Facilitates investment in practice known to drive impact</li> </ul>
 % tree survival (at year 3)	<ul style="list-style-type: none"> <li>Measures adoption of agroforestry maintenance (not just planting)</li> <li>Indicates tree permanence</li> </ul>

### A note on carbon impact and SBTs

Projects should invest in a measurement system that calculates carbon removals and reductions in line with GHG protocol to link progress to Chocolatier’s Science Based Target (SBTs).

#### Recommendations for linking carbon impact to SBTIs:

1. Leverage existing in-house tools and resources to minimize cost
2. Include farm-level practice data collection in project’s annual surveys to capture necessary data for GHG footprint tools
3. Work with MRV firms to fill resource gaps
4. Implement at a scale where impact will outweigh measurement costs

# An effective program must be complemented by long-term supply chain partnerships that benefit all stakeholders

Traders and cooperatives are needed to achieve sustainability goals, but do not have incentives to deliver

Long-term commercial partnerships can help align incentives and build a strong foundation for effective sustainability programs

Sustainability Objectives	Stakeholder Incentives		
	CHOCOLATIERS	TRADERS	COOPS
 STABLE SUPPLY	 Cocoa core input	 Revenue	 Revenue
 FARMER INCOME	 Living income goals	 Paid on volume of cocoa supplied	 Paid on volume of cocoa supplied
 DE-CARBONIZATION	 SBTIs	 Some have SBTIs	 Do not have SBTIs

Current Structure	
<b>Relationship structure</b> ( <i>chocolatier</i> → <i>trader/coop</i> )	<ul style="list-style-type: none"> <li>Annual contracts</li> <li>Transactional</li> <li>Coops/Traders deliver on activity KPIs</li> </ul>
Impact on stakeholders	
<b>Chocolatiers</b>	<ul style="list-style-type: none"> <li>Can rapidly adjust sourcing</li> <li>Unable to achieve lasting impact</li> </ul>
<b>Traders &amp; Coops</b>	<ul style="list-style-type: none"> <li>No incentive to invest in farmers</li> </ul>
<b>Farmers</b>	<ul style="list-style-type: none"> <li>Inconsistent advisory and support services</li> <li>Weak offtaker relationship</li> </ul>

Long-term Partnership
<ul style="list-style-type: none"> <li>Multi-year investment in specific catchment of farmers</li> <li>Coops/Traders deliver on outcome KPIs</li> </ul>
<ul style="list-style-type: none"> <li>Required for impact and reporting on decarbonization</li> <li>Maximize income impact</li> </ul>
<ul style="list-style-type: none"> <li>Prioritized and stable commercial relationship</li> <li>Increased value proposition to farmers</li> </ul>
<ul style="list-style-type: none"> <li>Consistent information</li> <li>Reliable support ecosystem</li> </ul>

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0. Executive Summary

1. Context

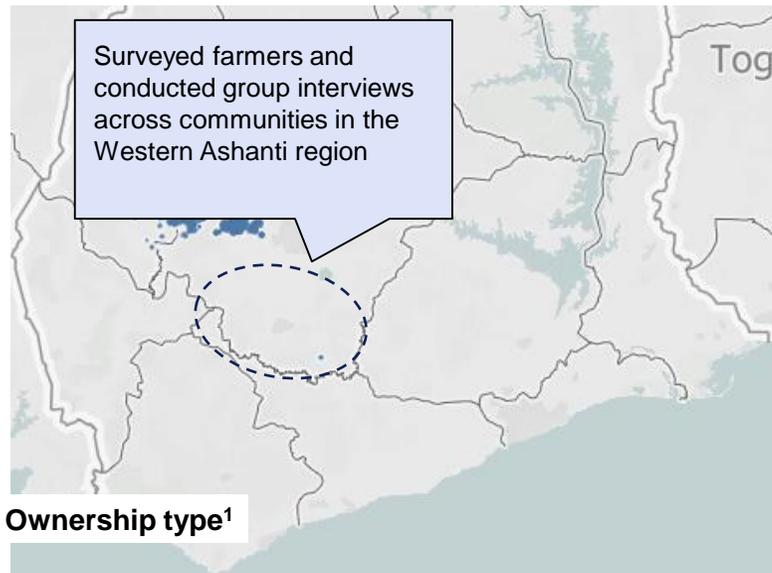
2. Principles

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# To inform project design, TechnoServe collected and analyzed primary data for a catchment of ~3k farmers in the Western Ashanti region in Ghana

## STUDY LOCATION & ACTIVITIES

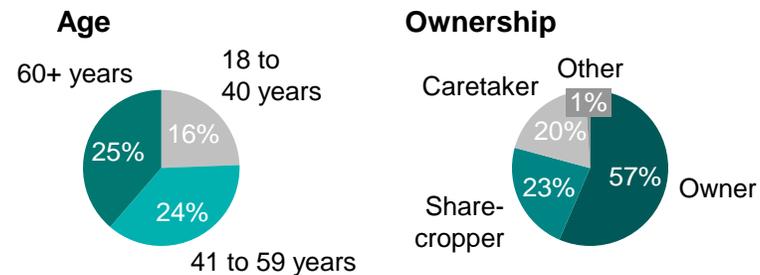


- Surveyed 150+ farmers 1:1
- Conducted focus group interview with 20+ communities
- Spoke with dozens of experts, agronomists
- Collected comprehensive secondary data
- Modeled farmer yield and profitability of various practice adoption scenarios
- Collaborated with South Pole to estimate carbon footprint and understand potential MRV costs
- Initiated pruning pilot to test two different service models for ~300 farmers

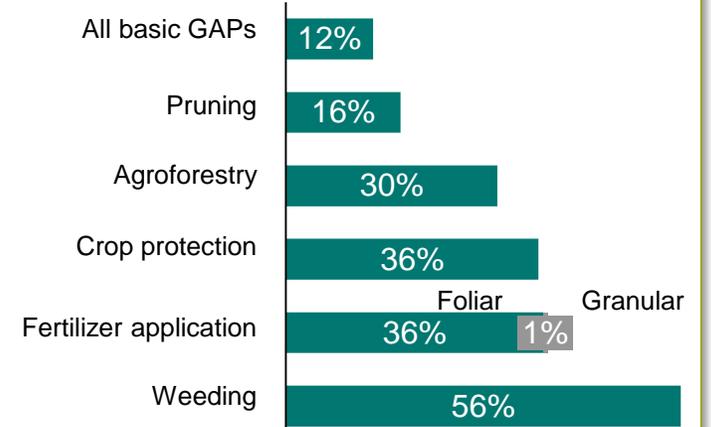
The study enabled a deep understanding of the sector and revealed detailed insights on farmer practices

## SELECT INSIGHTS

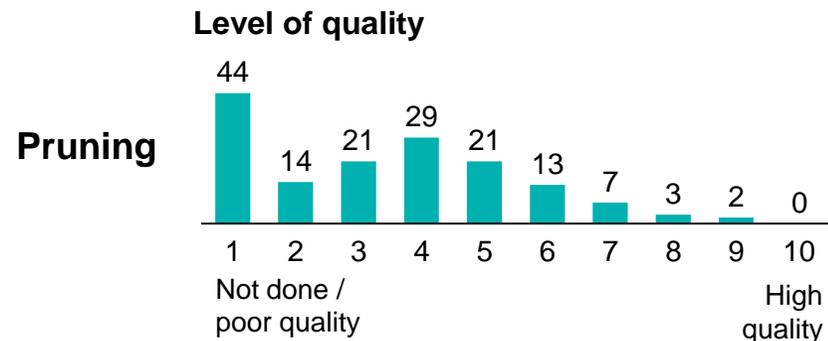
### KEY DEMOGRAPHICS



### DEGREE OF GAP ADOPTION



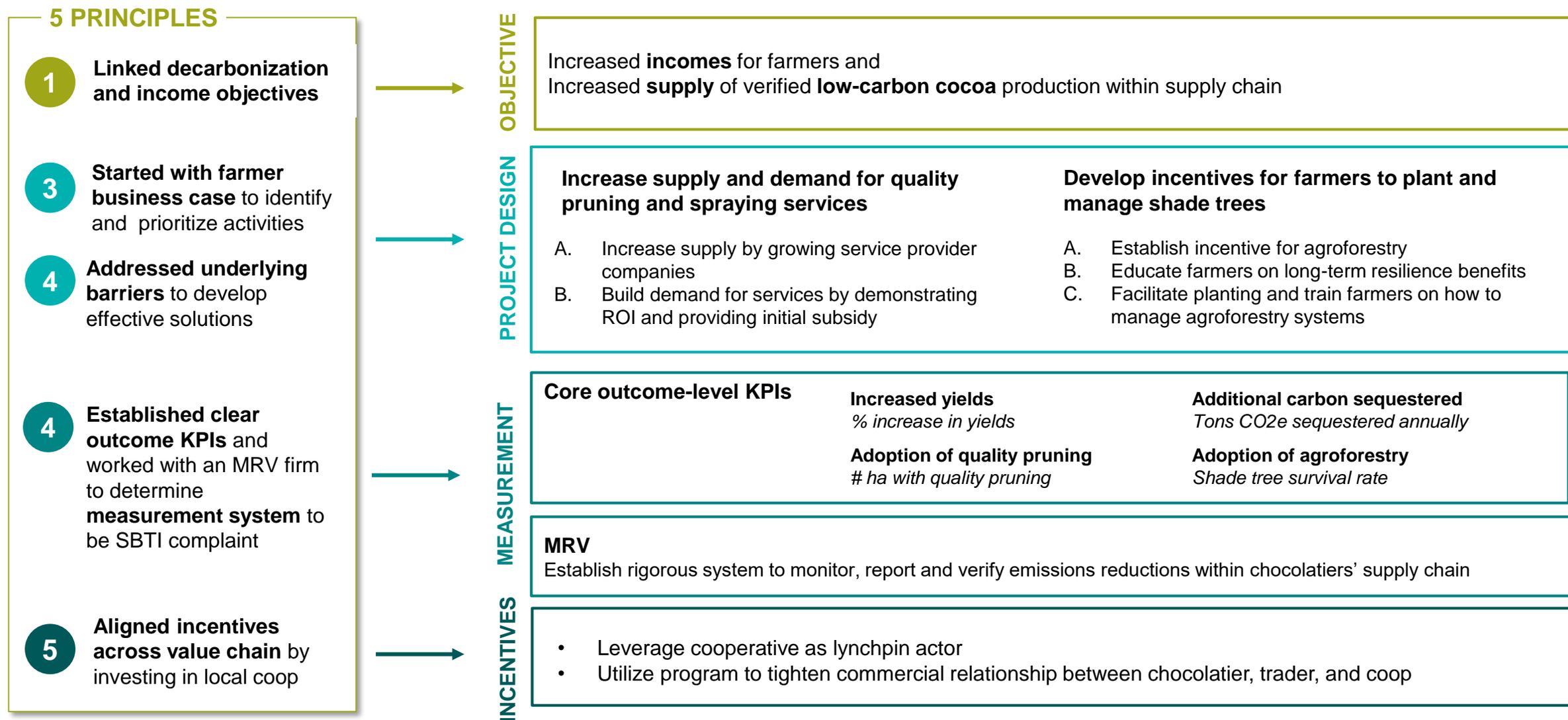
### QUALITY AND MANNER OF INDIVIDUAL PRACTICE ADOPTION



### Who executes activity?

Not practiced	38%
Practiced	62%
Farmer	34%
Family member	5%
Community member	22%
Hired labor	1%

# We then developed a project that linked decarbonization and income objectives and used the principles to establish project components, activities, and impact measurement



# To prioritize intervention areas, we mapped each agronomic practice based on farmer income and carbon emissions

Avg. farmer profile: 2.5 ha<sup>1</sup>, 400kg/ha, low adoption

■ Cocoa revenue 
 ■ Service cost 
 ■ Input cost  
■ Impact from yield increase 
 ■ Direct impact of practice

Agronomic practices	Year 10 profit changes, USD/farm		Upfront investment cost, USD	Carbon impact <sup>2</sup> , kg CO <sub>2</sub> e /kg of dried cocoa beans	
Weeding	-26	(26)	-	-	-
Pruning	-115	372	256	(29) Cost for pruning equipment shared among 3 farmers	-1.4 (1.4)
Soil management	-49	-214	331	68	-
Crop protection	-73	-47	307	187	(560) Cost for mechanised spraying equipment
Tree rehabilitation	-70	-77	395	248	(349) Cost to rehab 1 ha
Improved planting material	110			110	-
Shade trees +30 trees/ha	0			1	(25)
					-3.4 (3.4)

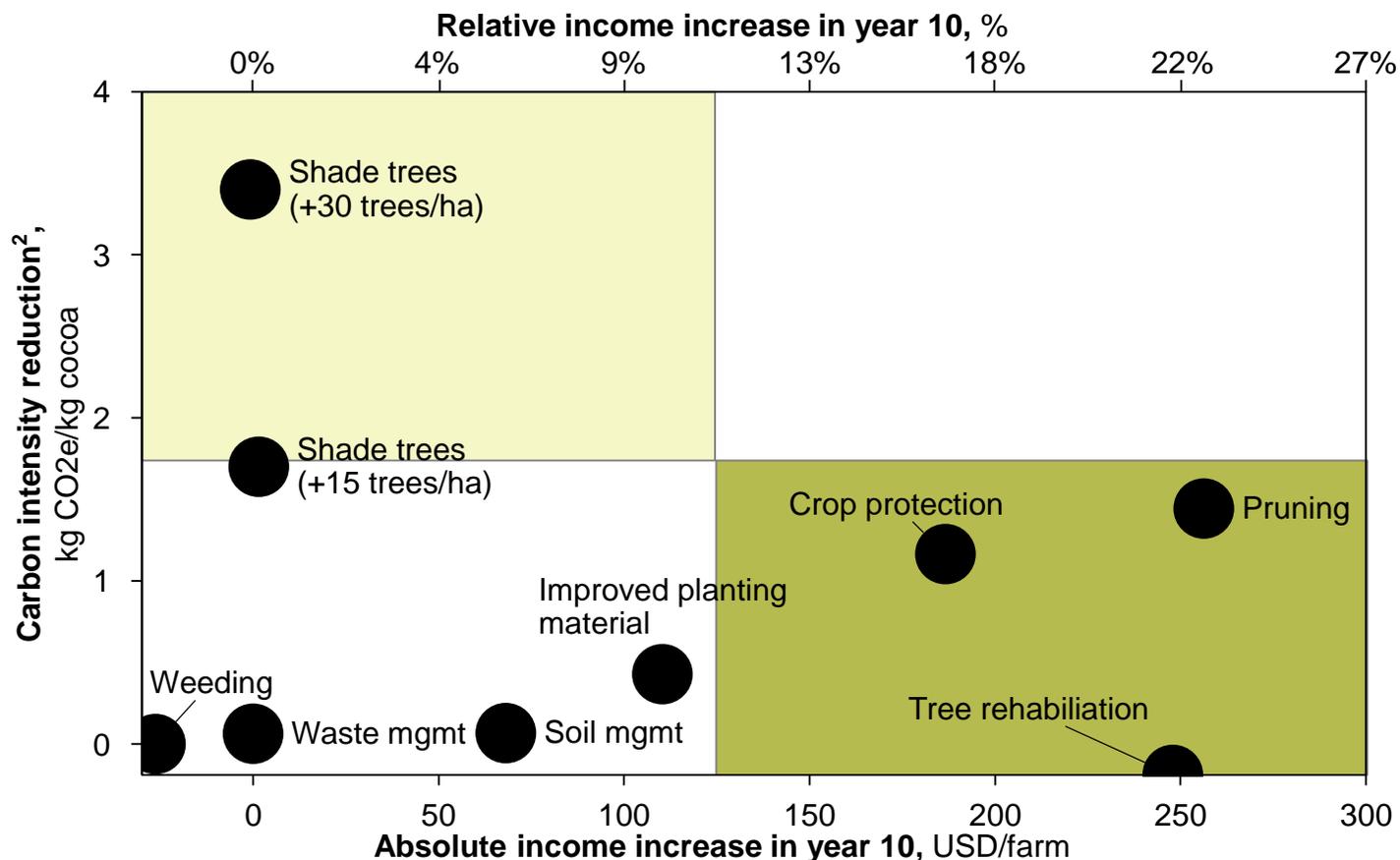
Note: 1. Farmer has an additional 0.5 ha of unproductive cocoa land that is not considered in this analysis; 2. Includes relative reduction through increased yields and absolute reduction through GAP adoption (e.g., fertilizer production & use) – carbon sequestration potential of shade trees assumed to be 70-80 kg CO<sub>2</sub>e/year/tree; Source: TNS analysis, South Pole

# Of all the agronomic practices, improving pruning, crop protection, and agroforestry show the highest potential ROI in terms of income and carbon

Preliminary & indicative

Avg. farmer profile: 2.5 ha<sup>1</sup>, 400kg/ha, low adoption

## Income and carbon impact matrix – entire farm perspective



### Synthesis

*High income / low carbon impact*

**Insight:** Practices would increase farm profitability if done correctly

**Response:** Prioritize pruning and crop protection as “lowest hanging fruit” where there is high need for support

*Low income / high carbon impact*

**Insight:** Practices that play the biggest role in decarbonization, but, individually, are not economically incentivized

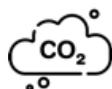
**Response:** Carefully consider tradeoffs of carbon removals, farmer incentives, and MRV costs to align on agroforestry approach

Note: 1. Farmer has an additional 0.5 ha of unproductive cocoa land that is not considered in this analysis; 2. Includes relative reduction through increased yields and absolute reduction through GAP adoption (e.g., fertilizer production & use) – carbon sequestration potential of shade trees assumed to be 70-80 kg CO<sub>2</sub>e/year/tree; 3. Carbon intensity reduction depends heavily on adoption of other GAP, e.g., fewer GAP adopted leads to higher impact of shade trees, average if ~2kg considered. Source: TNS analysis, South Pole

# Agroforestry is important to meet carbon objectives but no clear business case for farmers; an incentive is needed to ensure farmer adoption

## 1 Is an incentive needed for agroforestry?

Yes, otherwise farmers won't adopt



Farmer's carbon footprint does not impact their sales or income



Yield and income impact for agroforestry is marginal



Upfront cash needs outweigh long-term soil health and climate adaptation benefits

## 2 How should it be structured?

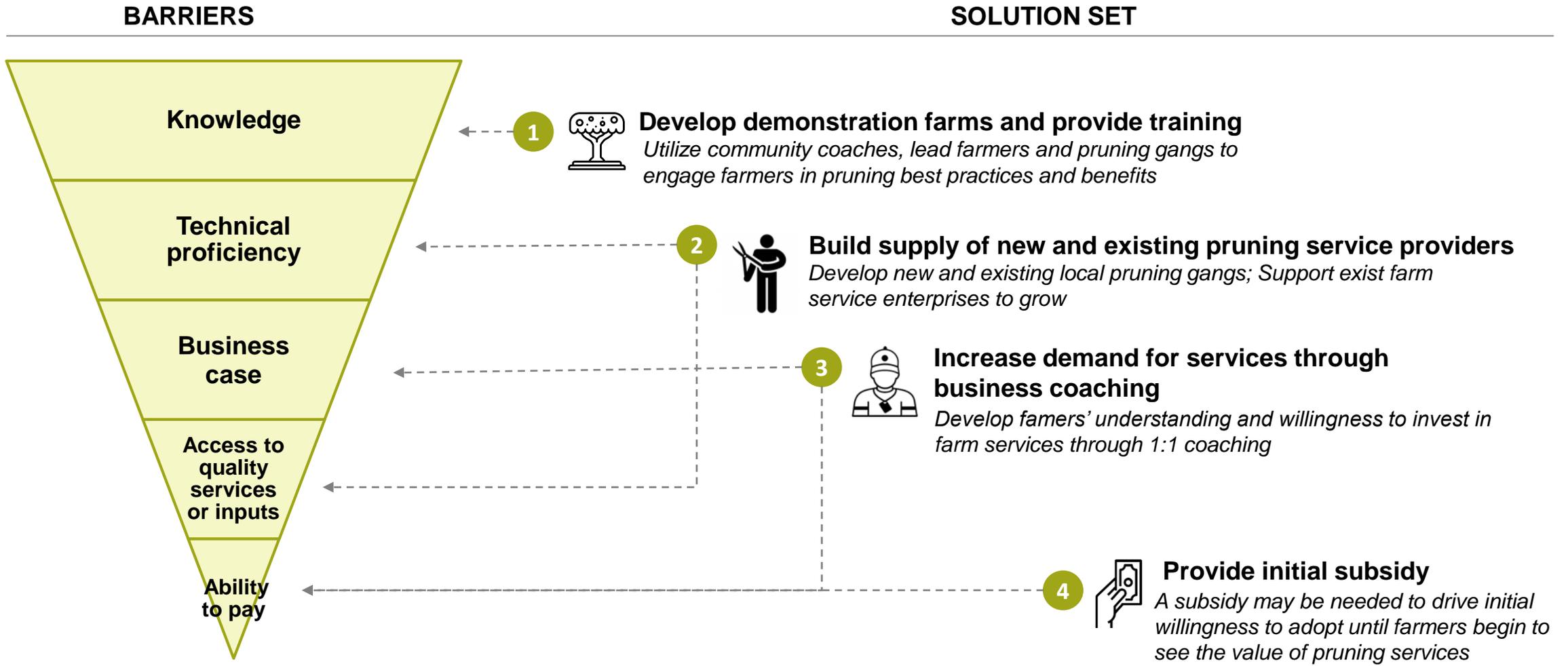
Explore cash and in-kind options

INCENTIVE	RECOMMENDATION	JUSTIFICATION
In-kind – Additional training	<b>INSUFFICIENT</b>	<ul style="list-style-type: none"> <li>- Farmers often already have access to training</li> <li>- Difficult to determine value of in-kind service</li> </ul>
Direct cash payment	<b>SUFFICIENT</b> if payment is optimized for farmer business case	<ul style="list-style-type: none"> <li>- Simple administration</li> <li>- Farmers appreciate cash in hand, particularly if delivered outside of harvest season</li> </ul>
In-kind – Subsidy for farm services	<b>RECOMMENDED</b>	<ul style="list-style-type: none"> <li>- Addresses farmer challenge of inability to afford labor</li> <li>- Links agroforestry to overall GAP adoption and improved farm management</li> <li>- More complex administration</li> </ul>

*PES should aim to return value of carbon sequestered to farmer while keeping program costs economically viable*

Note: 1. Based on full-sun farming system without shade trees; 2. Costs do not include additional management costs, which are likely to increase as density increases. Based on system incl. basic GAP adoption such as regular pruning and crop protection; 3. Carbon sequestration potential of shade trees assumed to be 70-80 kg CO2e/year/tree; Source: TNS analysis, South Pole

# We developed a set of solutions that address all barriers to pruning adoption



# The project set specific outcome-level KPIS that capture quality adoption and drive impact

## KPIS

# ha with quality pruning  
(level 7 or above)

% shade tree survival  
(at year 3)

\$ additional farmer income

Mt CO2e mitigated

% increase in yields

## Industry stakeholders should align on a standard pruning quality grading scale

### ILLUSTRATIVE

- |           |   |
|-----------|---|
| <b>1</b>  | <b>POOR</b><br>No space between canopies, overgrown crowns, branches of trees intertwined, low branches make it hard to walk through plot |
| <b>2</b>  |   |
| <b>3</b>  |   |
| <b>4</b>  | <b>SATISFACTORY</b>   |
| <b>5</b>  | Evidence of pruning – space between canopies, but some unbalanced or overgrown canopies.  |
| <b>6</b>  |   |
| <b>7</b>  | <b>QUALITY</b>  |
| <b>8</b>  | Space between canopies, balanced crowns, no intertwined branches or low branches.   |
| <b>9</b>  |   |
| <b>10</b> |   |



Un-pruned cocoa plot



Pruning technique demonstrated by expert laborer

# TechnoServe also investigated the requirements for linking agroforestry carbon impact to SBTIs; Costs should be considered against carbon value

Carbon impact can only be linked to SBTIs if sourcing is traceable to the farmer

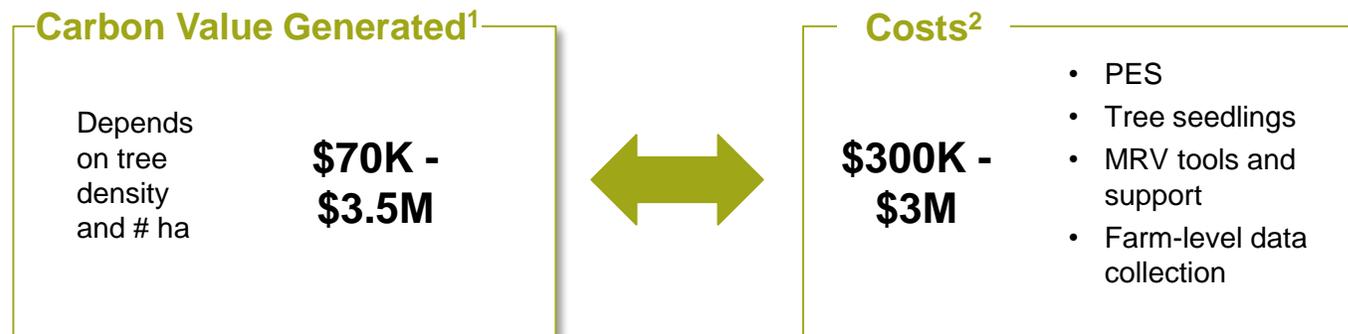
### MRV Activities

- Identify and target support to farmers within supply chain
- Collect baseline measurements: Classification of land use change, carbon stock calculations, farm practices
- Project documentation
- GHG footprint calculator
- Field level data gathering for midline & endline evaluations
- 3<sup>rd</sup> party verification

Activities may be conducted in-house or through MRV partner

*Preliminary and Illustrative*

MRV is costly. When designing an agroforestry initiative, scale and tree density should be considered vis-à-vis costs.



### Identify optimal scale and agroforestry density

# of ha	# of trees proposed per ha						
	15	25	35	45	55	65	75
2,200	\$ (233,335)	\$ (219,255)	\$ (205,175)	\$ (191,095)	\$ (177,015)	\$ (162,935)	\$ (148,855)
5,000	\$ (212,125)	\$ (180,125)	\$ (148,125)	\$ (116,125)	\$ (84,125)	\$ (52,125)	\$ (20,125)
10,000	\$ (174,250)	\$ (110,250)	\$ (46,250)	\$ 17,750	\$ 81,750	\$ 145,750	\$ 209,750
15,000	\$ (136,375)	\$ (40,375)	\$ 55,625	\$ 151,625	\$ 247,625	\$ 343,625	\$ 439,625
20,000	\$ (98,500)	\$ 29,500	\$ 157,500	\$ 285,500	\$ 413,500	\$ 541,500	\$ 669,500
25,000	\$ (60,625)	\$ 99,375	\$ 259,375	\$ 419,375	\$ 579,375	\$ 739,375	\$ 899,375
30,000	\$ (22,750)	\$ 169,250	\$ 361,250	\$ 553,250	\$ 745,250	\$ 937,250	\$ 1,129,250
35,000	\$ 15,125	\$ 239,125	\$ 463,125	\$ 687,125	\$ 911,125	\$ 1,135,125	\$ 1,359,125

1. Value at \$20 per ton of carbon mitigated. 2. Costs vary depending on existing MRV tools and resources of chocolatier, trader, cooperative and existing farm-level data



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