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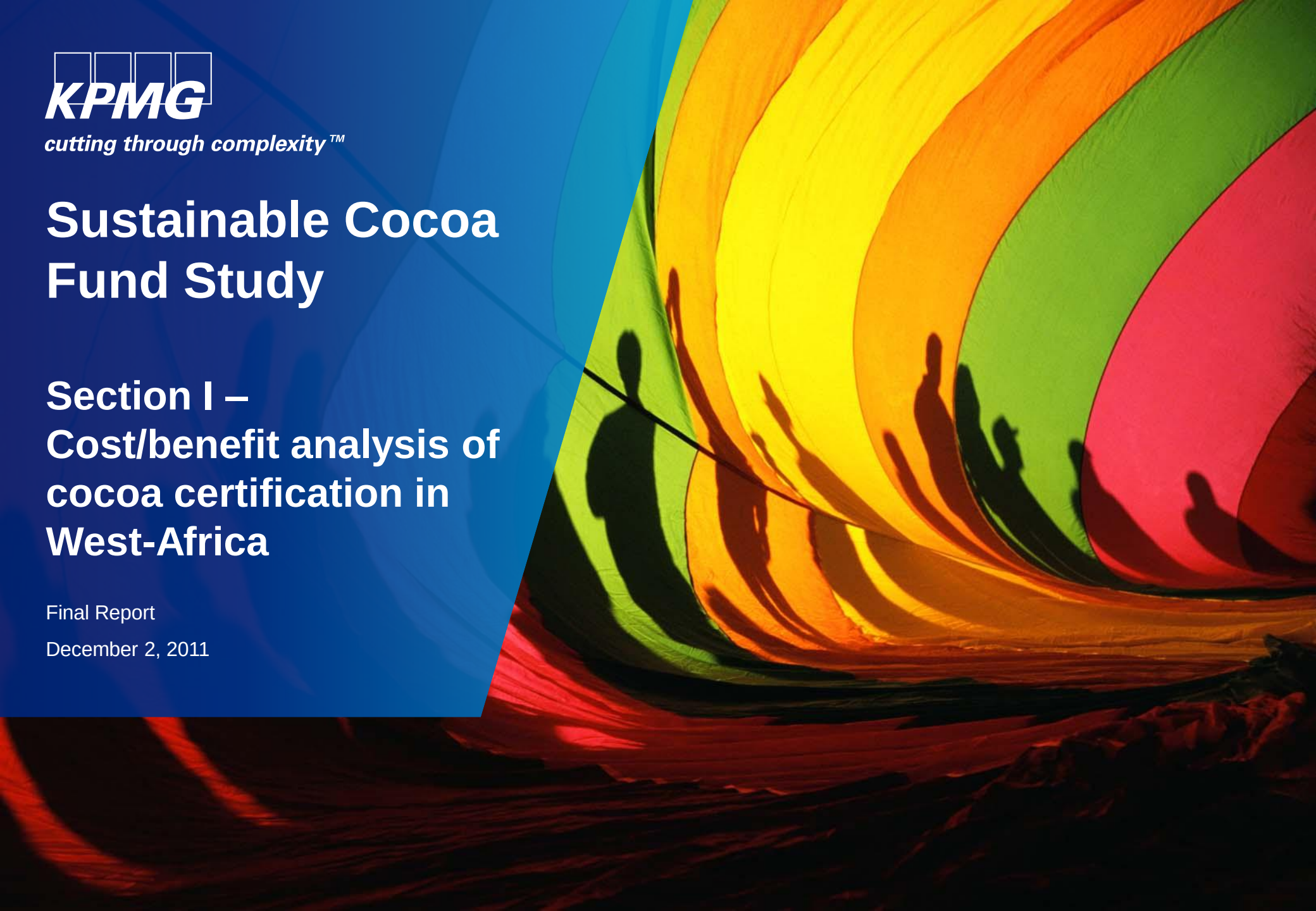
Sustainable Cocoa Fund Study

Section I – Cost/benefit analysis of cocoa certification in West-Africa

Final Report

December 2, 2011



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Private and confidential
Stichting IDH Sustainable Trade Initiative
Nieuwekade 9
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For the attention of: Mr. L. Peppelenbos (PhD)

Dear Mr. Peppelenbos,

We appreciate the opportunity to have assisted Stichting IDH Sustainable Trade Initiative, supported by the Ministry of Economische Zaken, Landbouw en Innovatie, in the conduct of the Sustainable Cocoa Fund Study. As of December 2, 2011, we have completed all services as described in our engagement letter ref. 2011-075\BH\JT\ro, dated July 12, 2011 and further agreed upon in following conversations.

Aim of the assignment was to gain an understanding of what type of financial intervention might be required to substantially upscale the volume of sustainable cocoa produced in West-Africa, assuming certification as the major enabling condition for increasing sector transparency and securing investments at farmer level.

Research was done through a multi-pronged approach, combining desk-research, expert interviews, using the international KPMG network and modeling. The research has particularly been focused on Ghana and Ivory Coast.

Our end report contains two sections. The first section contains a cost/benefit analysis of the certification of West-African cocoa farmers. The second section provides a high level analysis of the segmentation of farmers along relevant criteria and ideas.

This document represents Section I of our end report.

It has been our privilege to have had the opportunity to work with you, and we look forward to continuing our relationship.

Yours sincerely,

Bernd Hendriksen,
Director & Dutch Practice Leader Sustainability

the sustainable trade initiative

Ministerie van Economische Zaken, Landbouw en Innovatie

Contents

Analytical Framework

Model design

We seek to understand the systemic impediments to certification by understanding the cost-benefit of interventions as well as system constraints

Analytical framework [a]

Within current system constraints

Intervention options	System costs	Outcome of interventions	System benefits

- Training
- Facilitating input use
- Pre-financing
- Price guarantees
- Etcetera
	- Training costs
	- Audit / membership costs
	- Transition investments
	- Input costs
	- Cost of price guarantees
	- Cost of pre-financing
		- Δ # farmers certified
		- Δ % of qualified production through certified channel
		- Δ yield / ha
			- Increased coop / farmer income
			- Increased volume of certified cocoa available
			- Self-sufficient system
			  - Reduced third party financing
			  - Reduced premium for manufacturer

Adding system resources

Cost of adding resources

- Adding training capacity
- Adding audit capacity
- Adding risk capacity [b]
- Aggregating more farmers
- Making more plant material available

Comments

For each intervention it is possible *ceteris paribus* to calculate the costs to the system and the benefits in terms of increased volume and increase in farmer / coop income

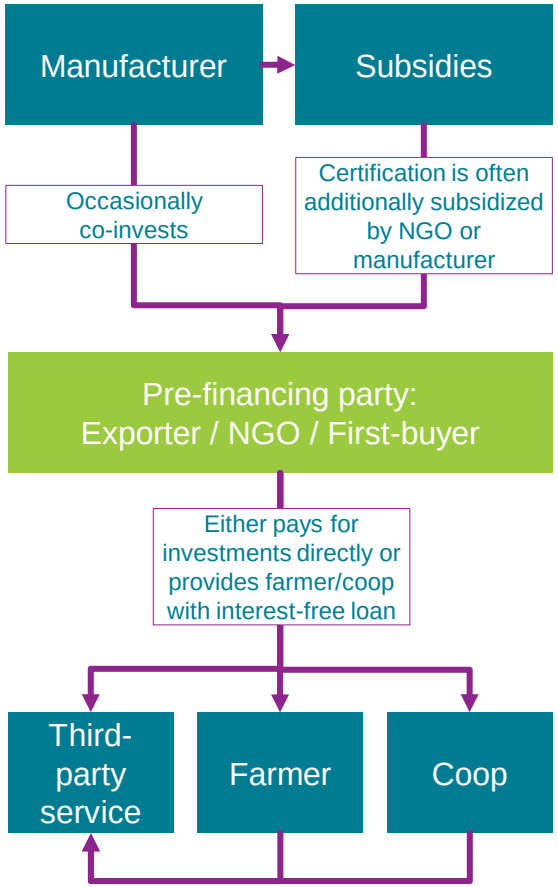
In addition it is necessary to understand the system constraints because once interventions are scaled up they will run up against system limits and additional investments will be required

Note: (a) Interventions, costs and benefits are not exhaustive
(b) Adding risk capacity refers to mitigating the additional risks that result from upscaling for those who pre-finance certification and additional interventions

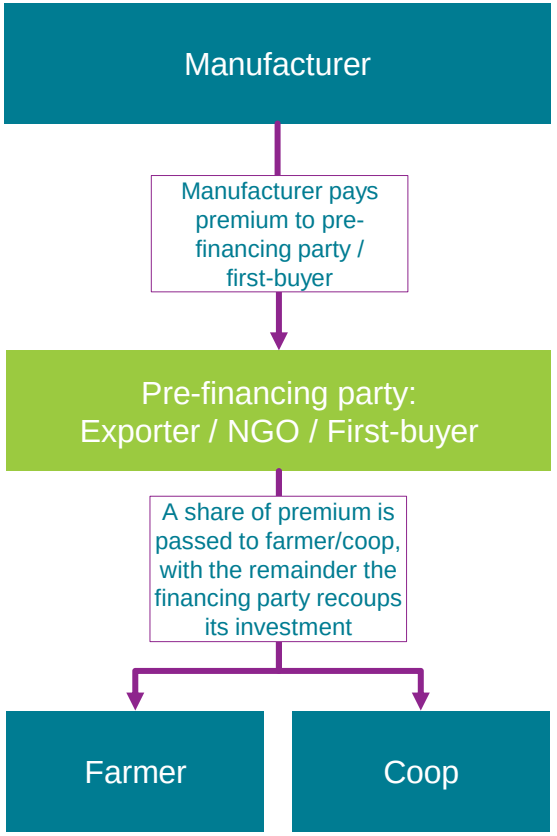
Unit of analysis

The modeling is mainly done from perspective of pre-financing party as the cash impact of certification for farmers is usually limited

Cash flow – investment phase



Cash flow – post-investment phase



Comments

Required investments such as training, buying motorbikes and computers, are usually financed by third parties such as exporters, NGOs or first-buyers, which have more ready access to the required capital

Whether the investment is financed directly, or through an interest-free loan to the farmers/coop, the farmer typically does not have to make an upfront investment

Investments may take the form of buying in services from third-party service providers or providing services directly, e.g. by setting up a proprietary training program.

The certification of cocoa appears to be dependent on subsidies from third-parties such as NGOs or additional funding from manufacturers.

Investments are recouped by holding back part of the premium once certified cocoa is sold to manufacturers

Transparency relating to the payment and flow of premiums may need to be improved in order to maximize impact

Model outcomes

Model outcomes

A selection of variables has been selected in order to model a range of interventions

Model – Inputs

INPUTS		
Certification		
Time that it takes to certify	1	years from start of investment
Increase in yield resulting from certification training	23%	% change from baseline
Basics		
Number of members per coop	300	farmers
Area per farmer	2.5	ha
Baseline yield	0.5	MT/ha
Baseline price per tonne	3390	$/MT
Farmgate price	70%	% of baseline price
Assumed premium	195.00	$/MT cert
Percentage of premium passed on to coop/farmer[a]	60%	% of premium
Percentage of premium to farmer [a]	40%	% of premium
Grant funding received	50.00	$/MT cert
Period of grant funding	3	year
Premium retrospectively [b]	No	
Baseline 'leakage' to conventional channel [c]	30%	% of production
'Leakage' due to multi-certification [d]	10%	% of production
First year of input financing	1	Period (2nd year)
Subsidy on fertilizer	0%	% of cost
Share of input financing repaid (first year)	85%	% of principal & interest
Increase in repayment rate (next 2 years)	5%	increase per year
Reduction in leakage to conventional due to crop financing	50%	
Required return on 40% first-loss on crop financing	15%	

See section **'Overview of assumptions'** for further detail on inputs

Comments

Modelling the costs and benefits of certification and a number of supplementary interventions requires the input of a range variables

Values for these variables have been triangulated based on the literature as well as interview feedback and validated through feedback from an expert group

The section 'Overview of assumptions' provides background to the inputs

Note:

(a) Premium is paid to first buyer or other party that has pre-financed certification. A share of this premium is passed on to the certified farmers and/or the coop. Two-thirds of the passed-on premium is assumed to go to farmers

(b) In some cases, cocoa produced by farmers in transition to certification may be labeled as certified retrospectively, in which case a premium will be received

(c) Leakage to conventional channel is defined as the share of production of pre-qualified cocoa which is sold through conventional channels rather than the certified channel

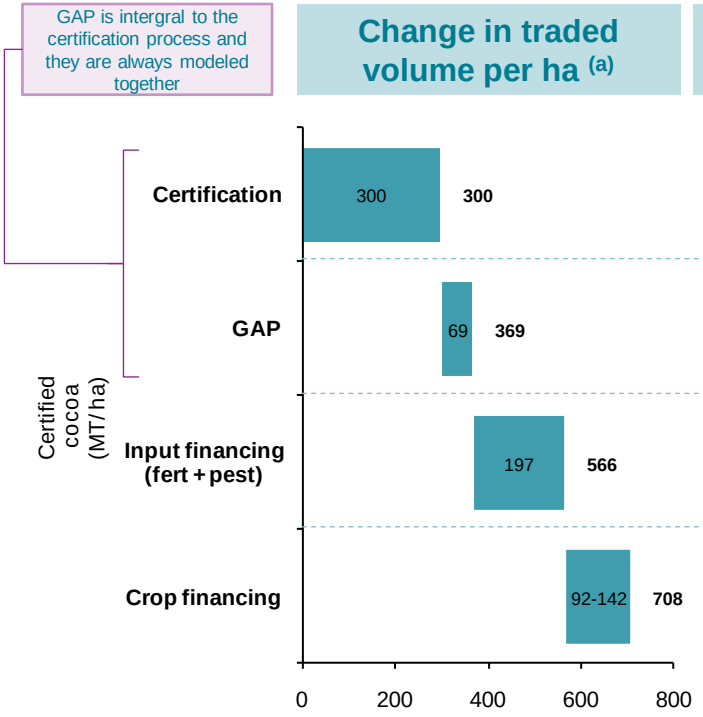
(d) Leakage due to multi-certification results from multi-certified farmers selling certified to two (or more) different certificate holders, each of which has made the required investments. As a result, the pre-financing party receives a reduced share of overall production

Model outcomes

A selection of interventions are modeled in order to estimate their cost and benefit

Model – Interventions – Financer perspective

GAP is intergral to the certification process and they are always modeled together



Cost (b) ($/MT cert)	Assumptions
$136	• Baseline productivity of 500 kg/ha • 30% leakage to conentional sales and 10% leakage due to multi-certification • Costs/farmer: one-off $110, 60% cost by year 3
$68	• Yield increase of 23% of baseline production after 3 years • Cost of GAP training: $35 / farmer
$106	• Yield increase of 329 kg/ha for fertilizer and pesticide combined • Cost $231/ha, interest rate 10% • Initial repayment rate of 85%, increasing YoY
$47	• Better pre-financing can reduce leakage from 30% to 15% • Required return 40% first-loss guarantee:15% • Range reflects varying base, which depends on interventions chosen

Comments

In addition to the variables shown on the previous page, a range of intervention-specific variables are used, such as the cost of fertilizer, the yield improvement due to fertilizer and the risk-cost of crop financing

For each intervention it is possible to calculate the marginal cost (cost per extra tonne of certified cocoa), as well as the benefit

Note: (a) Change in traded volume of certified cocoa per hectare per year as a result of the given intervention, i.e. the volume available to the investor
(b) Cost is shown per MT of certified cocoa over a period of 5 years

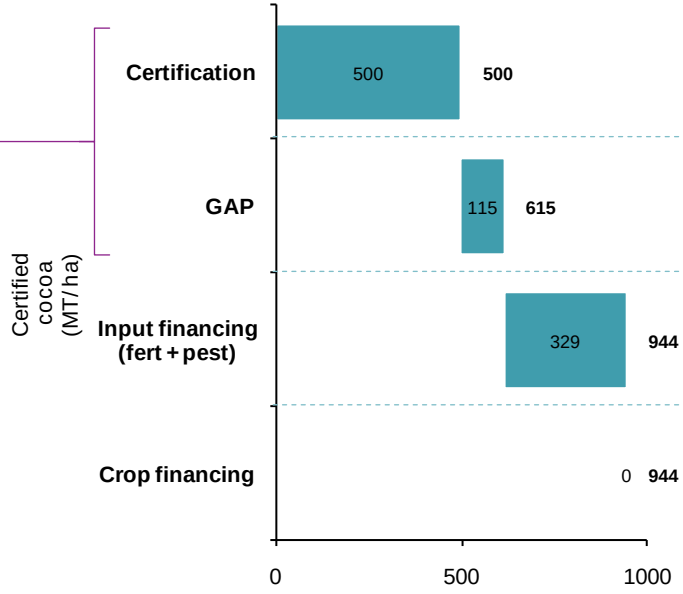
Source: Destktop research ; KPMG interview programme Aug-Oct 2011

Model outcomes

A selection of interventions are modeled in order to estimate their cost and benefit

Model – Interventions – Farmer perspective

GAP is intergral to the certification process and they are always modeled together



	Change in produced volume per ha [a]	Cost [b] ($/farmer)	Benefit [c] ($/farmer)	Assumptions
Certification	500 → 500	$30	$60	• Baseline productivity of 500 kg/ha • Costs for shade tree planting • 28% of labor is hired (cash-impact)
GAP	115 → 615	$64	$2,060	• Yield increase of 23% of baseline production after 3 years • Cash-cost of GAP: $5.10/yr
Input financing (fert + pest)	329 → 944	$2,385	$7,987	• Yield increase of 329 kg/ha for fertilizer and pesticide combined • Cost $252/ha[d], interest rate 10% • Initial repayment rate of 85%
Crop financing	0 → 944	$0	$18-$28	• Better pre-financing can reduce leakage from 30% to 15% • Range reflects varying base, which depends on interventions chosen

Comments

Interventions can result in significant income increases for farmers (over a period of five years), while the costs are limited

The premium represents only a marginal part of the overall benefit to the farmer

Some of the costs, particularly for certification and GAP, may be made ahead of the realization of the benefits

Note: (a) Change in volume produced per hectare per year as a result of the given intervention, where GAP increase in productivity is spread over 3 years
(b) Cost is shown per farmer over a period of 5 years; assumes 2.5 ha/farmer
(c) Shows increase in income over a period of 5 years, including premium; assumes 2.5 ha/farmer
(d) $231/Ha is for inputs and interest on loan, while $21/Ha is for additional hired labour (28% of total extra labour is assumed to be hired)

Source: Destktop research ; KPMG interview programme Aug-Oct 2011

The model calculates the pay-back period that results from the applied interventions

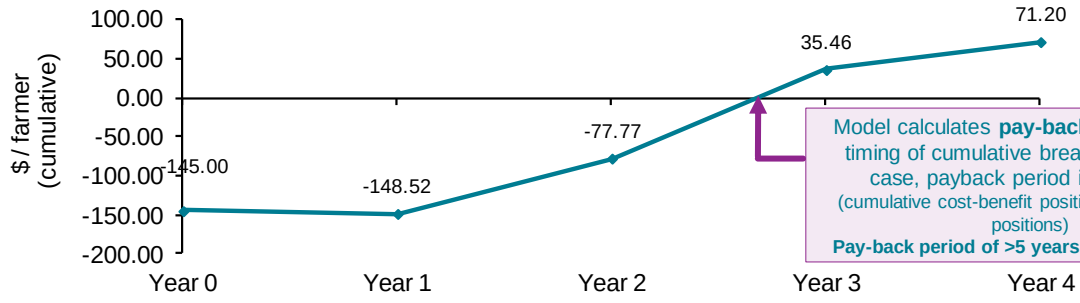
Model – Sample outcome (interventions: certification + GAP + crop financing + input financing)

Yield goes up as a result of better practice and use of inputs

Leakage is reduced as a result of more liberal crop financing

Intertemporal cash-flow (interventions: certification + GAP + crop financing + input financing

	Unit	Year 0	Year 1	Year 2	Year 3	Year 4	Total	Total / MTcert
Volume of certified cocoa traded								
Total production available for cert channel	MT / farmer	1.25	2.17	2.26	2.36	2.36	10.40	
Leakage (conventional sales + multi-certification)			35%	30%	25%	25%		
Volume of certified traded	MT / farmer	0.00	1.41	1.58	1.77	1.77	6.53	
Cost-benefit exporter								
Total costs	$ / farmer	-145	-184	-132	-113	-102	-677	**-104**
Premium received	$ / farmer	0	275	309	345	345	1274	**195**
Grant funding received	$ / farmer	0	70	79	89	0	238	**36**
Premium passed on to coop/farmer	$ / farmer	0	-165	-185	-207	-207	-765	**-117**
Net cost-benefit	$ / farmer	-145	-4	71	113	36		
Cumulative cost-benefit	**$ / farmer**	**-145**	**-149**	**-78**	**35**	**71**		



Model calculates **pay-back period** as the timing of cumulative break-even. In this case, payback period is **3.7 years** (cumulative cost-benefit positions are year-end positions)

Pay-back period of >5 years is shown as N/A

Cost of $104 per certificed metric tonne over a period of 5 years

Premium per tonne is assumed to be constant. After pay-back period, it may be possible to reduce premium or increase share to farmer/coop

Grant funding of $50 per tonne for the first 3 years

Share of premium passed on to coop/farmer assumed to be constant (60%). This could be varied over time to speed up recouping of investments

In this case the financing party makes a profit after break-even. In reality the share of premium to the farmer/coop may increase or the premium may decrease

A combination of interventions is required to derive an acceptable pay-back period

Model – Sensitivities [a]

A **Base-case scenario**

Certification	Better practice	Crop financing	Input financing	Pay-back period
✓	✓	✗	✗	NA
✓	✓	✓	✗	4.4
✓	✓	✓	✓	3.7
✓	✓	✗	✓	NA

B **Intervention: Certification + GAP**

Cost of better practice training ($/farmer)	Yield from better practice: 10%	23%	35%	45%
10	#N/A	#N/A	3.9	3.6
25	#N/A	#N/A	4.8	3.9
35	#N/A	#N/A	#N/A	4.1
50	#N/A	#N/A	#N/A	4.9

Comments

A Using the base-case assumptions, the payback period is longer than 5 years unless a combination of interventions is applied

B Even when the assumptions regarding GAP – which is considered an integral part of certification – are varied, the pay-back period can only be reduced if GAP results in significantly higher yield improvements than in the base case. It should be noted that GAP is anyway a temporary measure that is not sustainable without increasing inputs

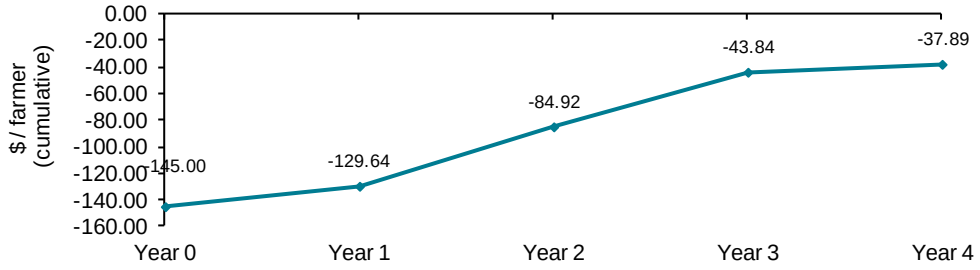
Key: = value used in model as 'base-case' ; "NA" = pay-back period is >5 years

Note: (a) Sensitivities are used to calculate the pay-back period for the pre-financing party

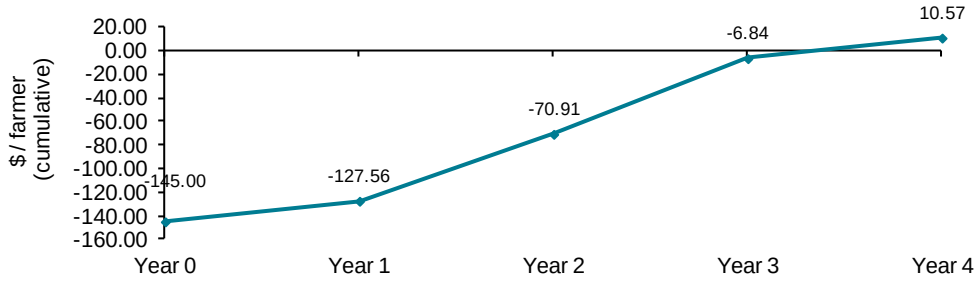
The business case can be improved by reducing leakage through crop financing, which can be facilitated through credit enhancement mechanisms (guarantees)

Crop financing

Base case	
Interventions	Certification + GAP
Pay-back period	N/A



Crop financing	
Interventions	Certification + GAP + crop financing
Leakage reduction	50%
Required return	15%
Pay-back period	4.4



Comments

Interview feedback suggests a share of certified cocoa is sold into conventional channels due to instant cash-need of farmer or incentives offered by traders such as a piece of soap, equipment or a loan for school costs. It is assumed that leakage is in the order of 30%. Farmers' risk aversion also stimulates them to sell to multiple buyers.

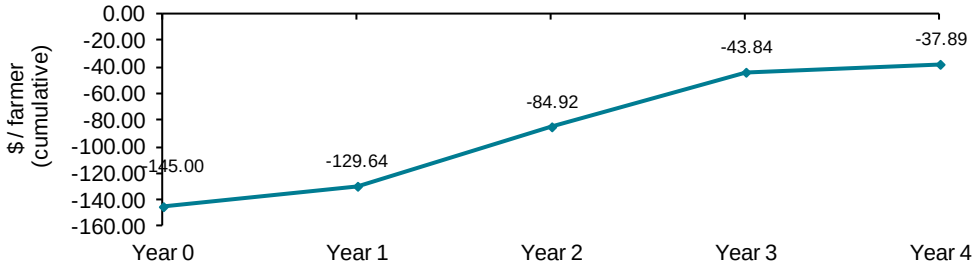
If crop financing can be used to reduce leakage of cocoa beans to conventional channels, the pay-back period can be reduced.

Crop financing may be facilitated through e.g., a 40% first-loss guarantee for which a 15% return is modeled. These values are yet arbitrary.

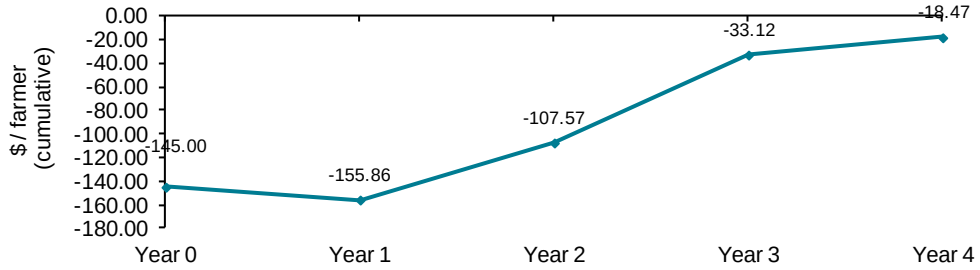
Input financing significantly enhances the business case, provided repayment rates are high and/or losses can be managed

Input financing

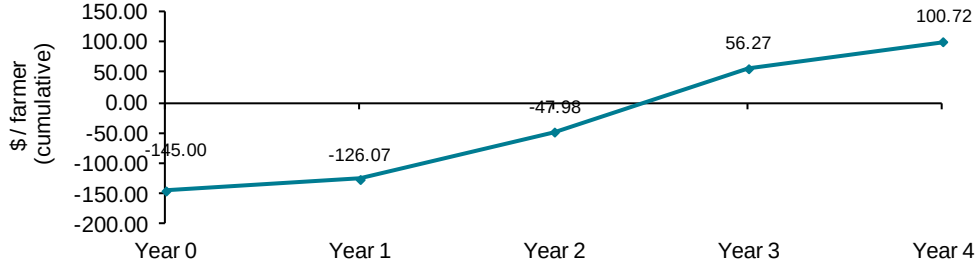
Base case	
Interventions	Certification + GAP
Pay-back period	N/A



Input financing	
Interventions	Certification + GAP + input financing (fert+pest)
Repayment rate	
- First year	85%
- Increase / year	5% [(a)]
Pay-back period	N/A



Input financing, lower risk	
Interventions	Certification + GAP + input financing (fert+pest)
Repayment rate	
- First year	90%
- Increase / year	5% [(a)]
Pay-back period	3.5



Comments

The pay-back period is improved once input financing is extended, and a high repayment rate is assumed.

Repayment rates can be improved through grouping responsibility for loans and, over time, by excluding farmers that fail to repay.

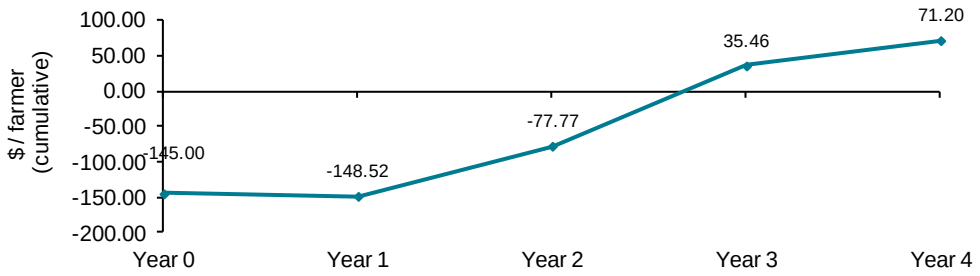
Additionally, losses to those extending input financing may be reduced if the risks can be spread over a large number of input financing schemes through a credit insurance fund.

Note: (a) Repayment rate increases each year as non-paying farmers are assumed to be excluded from input financing

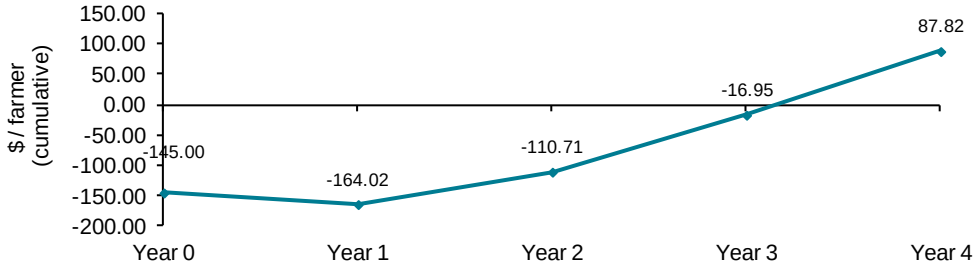
Model outcomes
It is possible to have a stand-alone business case without grant funding

Grant funding

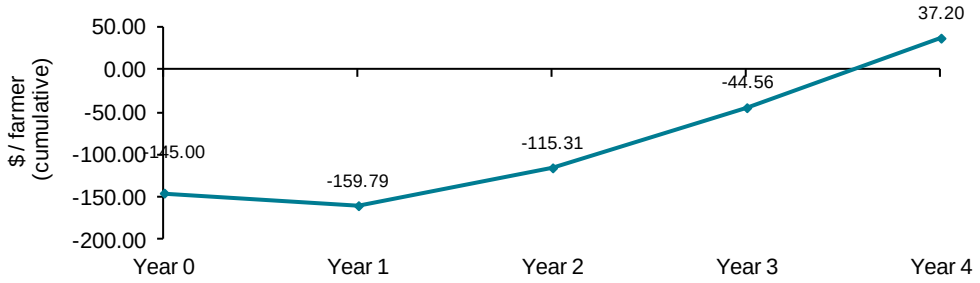
Base case	
Interventions	Certification + GAP + crop f + input f
Grant funding	$50 / MT (3 yrs)
Premium passed on	60%
Total leakage	40%
Pay-back period	3.7



Reduced premium passed on	
Interventions	Certification + GAP + crop f + input f
Grant funding	$0
Premium passed on	40%
Total leakage	40%
Pay-back period	4.2



Reduced leakage	
Interventions	Certification + GAP + crop f + input f
Grant funding	$0
Premium passed on	60%
Total leakage	0%
Pay-back period	4.5



Comments

In the base-case, it is only possible to have a pay-back period of <5 years when multiple interventions are combined.

However, this still assumes grant funding of $50 / MT for three years.

It is possible to remove grant funding if the premium that is passed on to the farmer and coop is reduced from 60% to 40%.

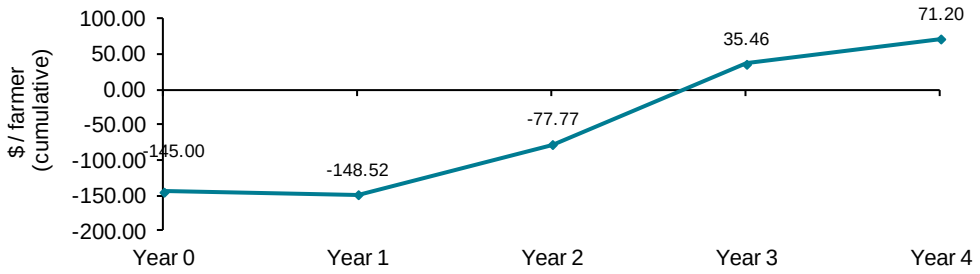
It is also possible to do away with reliance on grant funding if 'leakage' can be reduced to zero.

It thus seems possible to have a 'self-sufficient' system, provided that $195 / MT is an acceptable premium.

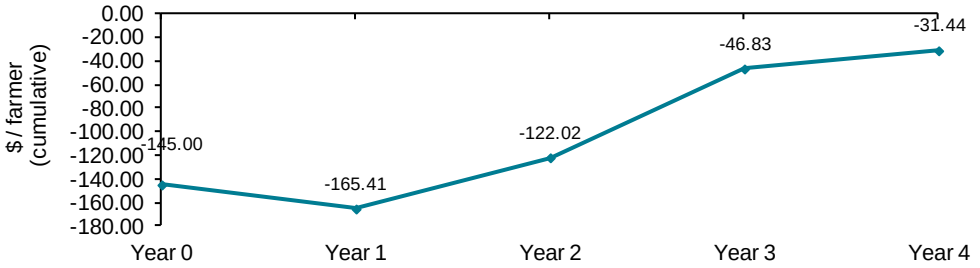
Certifying farmers with smaller farms may be challenging, inhibiting upscaling the certification effort without an increase in premium paid

Farm size

Base case	
Interventions	Certification + GAP + crop financing + input financing
Area per farmer	2.5
Pay-back period	3.7



Smaller farms + multiple interventions	
Interventions	Certification + GAP + crop financing + input financing
Area per farmer	2.0
Pay-back period	N/A



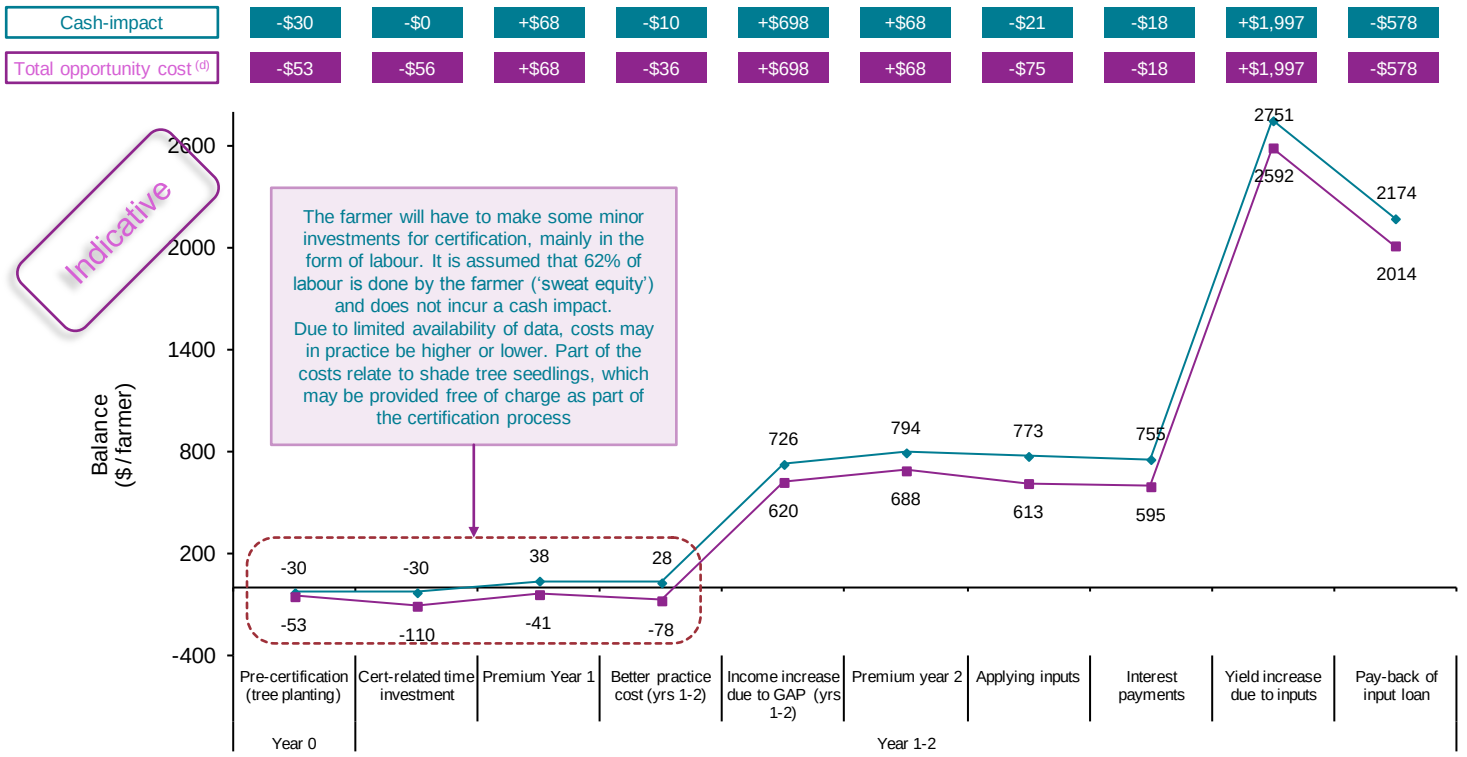
Comments

A smaller average farm size substantially deteriorates the business case.

This reduces the ability to up-scale the number of certified farmers, unless some form of cross-subsidizing can be applied.

Even when a business case can be made for certification, farmers may be reluctant to participate

Farmer P&L – Marginal cost-benefit analysis years 0-2 [(a)(b)(c)]



Note:
(a) Takes into account only the P&L impact associated with certification and further interventions (marginal cost-benefit analysis). E.g. money spent on harvesting is not considered as this is part of the farmer's recurring activities
(b) This analysis should be considered as 'indicative' only due to limited availability of data relating to farmer costs
(c) Assumes a farmer with 2.5 Ha, a yield of 500 kg/Ha, and leakage to conventional channel of 30%
(d) Total opportunity costs takes into account 'sweat equity', which is assumed to be 68% of total labour costs

Source: Desktop research ; KPMG interview programme Aug-Oct 2011 ; see also section 'Overview of input assumptions'

Comments

It is assumed that most of the investments related to certification are pre-financed by third parties such as traders, NGOs and manufacturers, such that the cash impact on the farmer is limited.

The main costs that the farmer must bear related to labor costs, up to 68% of which may be 'sweat equity', leaving a 28% cash impact (hired labor).

Even though the return on this labor appears attractive, farmers have an extremely high discount rate whereby they have a strong preference for avoided costs over increased revenues at a later date.

Various socio-economic factors also contribute to farmers' reluctance, including risk aversion, opportunity costs (time spent on certification may take away from an alternative source of income), and skepticism about 'development initiatives'.

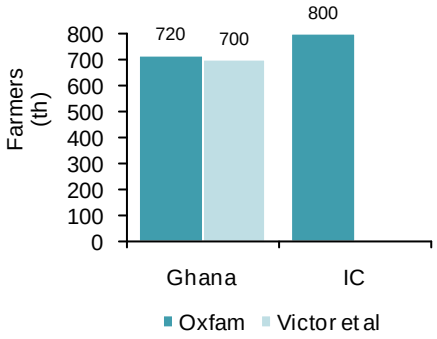
An up-front payment may help to incentivize farmers, although the risk of losing this investment is high.

Overview of input assumptions

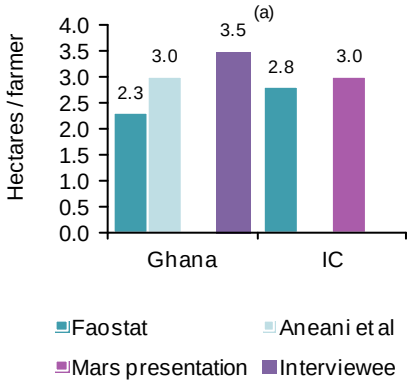
Overview of assumptions

Farm size and productivity

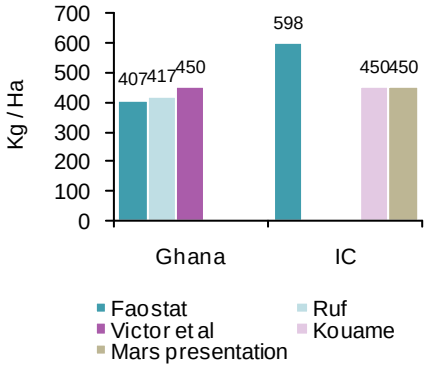
Number of farmers



Average farm-size



Average yield



Comments

Based on statistics from Faostat and an assumed number of farmers, average farm-size is calculated as 2.3 and 2.8 hectares per farm for Ghana and Ivory Coast respectively. This is roughly in line with estimates from other sources. An average of 2.5 ha/farmer is assumed as a base-case.

Estimates on average yield vary somewhat. Yield is strongly dependent on input use and the quality of plant material. Faostat provides yield statistics of 407 and 598 for Ghana and Ivory Coast respectively. An average yield of 500 kg/ha is assumed as the base-case and is taken to be the starting point for farmers that enter the certification process.

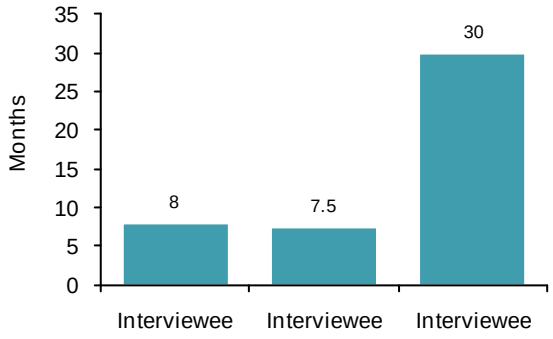
Base-case inputs		
	Assumed value	Unit
Average farm-size	2.5	ha
Yield per ha	500	kg/ha

Note: (a) This interviewee indicated that farmers that have thus far been certified ('lead farmers') have higher than average farm-size

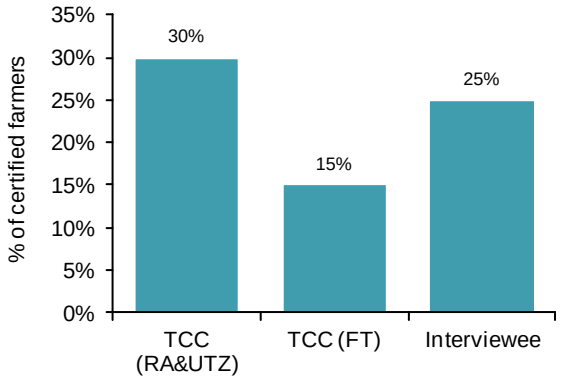
Overview of assumptions

Certification process

Average time to certify



% Double-certified



Comments

The time it takes to certify varies depending on the level of readiness of the farmers (e.g. are they already organized). The 30 months mentioned includes a process of group forming. The delay is also dependent on the certification scheme. One year is assumed to be the time to certify, provided a basic level of readiness. In case this level of readiness is lacking, further pre-investments would have to be modeled.

One interviewee mentioned that beans from the time that the certification process commences can be sold retrospectively as certified (and premium can be received), but this was not recognized by other interviewees.

Multi-certification is estimated at 20%, of certified farmers, the effect of which is to reduce the amount of certified cocoa that becomes available for a given investment. If double certification is assumed (rather than triple or more), this means that 10% leaks away for a given investment [(a)].

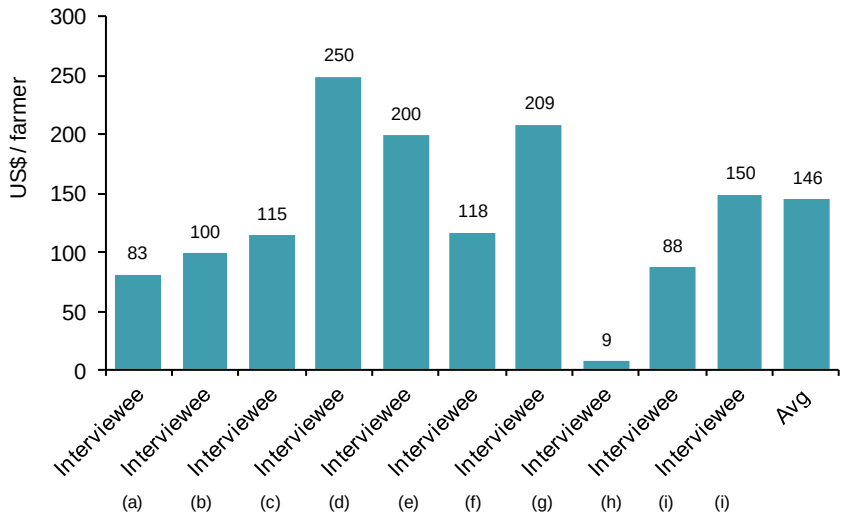
Base-case inputs		
	Assumed value	**Unit**
Time to certify	1	year
% multi-certified	20	%

Note: (a) Some multi-certification of farmers may be done by the same pre-financing party. In this case, there is no leakage to other pre-financing parties, but there may be additional costs. The model assumes that multi-certification is always done by multiple pre-financing parties

Overview of assumptions

Cost of certification – first year

Cost of certification - first year [a]



Cost breakdown (n=4)	Avg share of cost
Equipment and office accommodation	15%
Training (incl GAP)	20%
Membership & external audit	12%
ICS, Internal inspection, documentation	40%
Transportation	6%
Investments [j]	8%
Total	**100%**

Note:
(a) Internal control and external inspection only
(b) Training only
(c) Includes all costs, not clear if GAP training is included
(d) Includes all costs, including GAP training
(e) Includes all costs, training is biggest factor
(f) Utz certification
(g) RA certification
(h) FT certification. This appears to be an outlier that can only be partly explained by the fact that it concerns a very large cooperative that has been operational for many years. This estimate has been excluded from the average shown.
(i) This interviewee provided costs for large groups (>30k) and for small-medium groups (~4k). Costs provided represented only training and ICS and have been inflated according to average cost break-down in order to take into account additional costs
(j) Investments form a large part of costs for RA certification (30%); the average is much lower as the other budgets don't show specific standard-related investments. General investments such as computers and vehicles are included under 'equipment'

Comments

While sector experts employ ball-park figures to estimate the cost of certification, these vary strongly, may include different items, and a breakdown has been mostly unavailable.

A budgetary breakdown based on feedback suggests that costs related to internal control form a significant share, while training and equipment and office accommodation are also large items.

It further appears that training aimed at GAP is often integral to certification training and included in the costs.

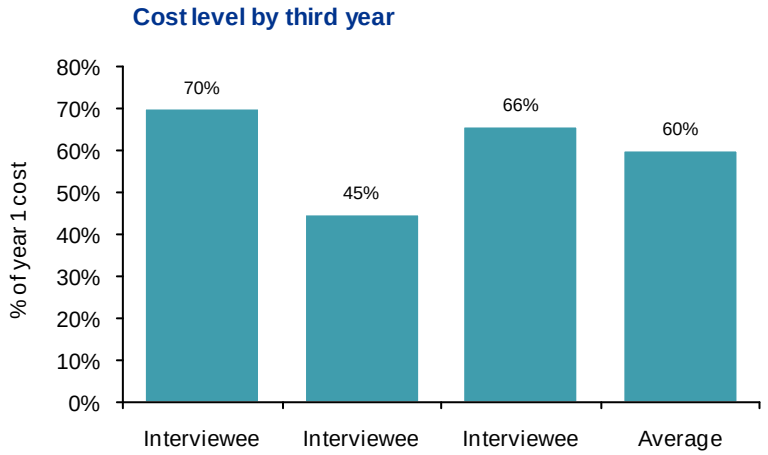
It is assumed that first-year costs are $145 / farmer (average of interviewee feedback, of which $35 is for better practice. Certification and GAP are always modeled together.

Compliance costs elsewhere in the chain are assumed to be negligible or included in the $110.

Base-case inputs	Assumed value	Unit
Cost of certification (first year)	110	US$ / farmer
Cost of GAP training	35	US$ / farmer

Overview of assumptions

Cost of certification – subsequent years



Comments

In ine first year, training intensity is high and one-off investments are made in items such as computers, motorbikes, farming equipment, storage sheds. In subsequent years, the cost level is lower.

Interview feedback suggests a cost level of around 60% of year 1 costs by year 3. There is a further suggestion that after a number of years, some renewal of investments is required.

Cost levels are assumed to decline to 60% by year three, then reach 70% in year 4 to take into account renewal of investments, before returning to 60% in year 5.

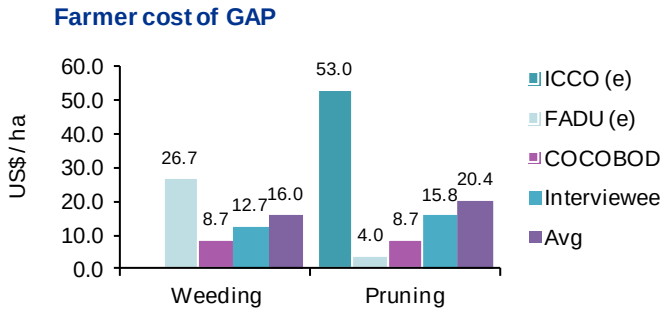
These costs include a.o. internal control costs, audit costs, membership fees and continued training or the services of an agronomer.

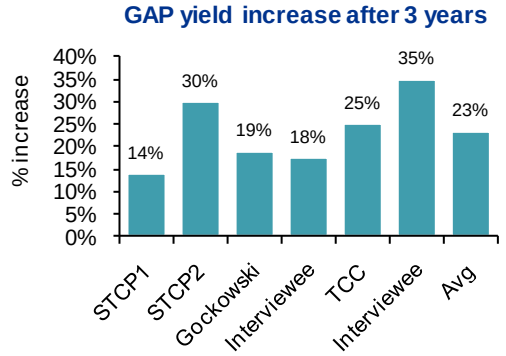
Base-case inputs		
	Assumed value	Unit
Year 1	110	US$/farmer
Year 2	88	US$/farmer
Year 3	66	US$/farmer
Year 4	77	US$/farmer
Year 5	66	US$/farmer

Overview of assumptions

Cost of certification – farmer impact

Farmer cost of certification	
	Calculation
Admin and related	
Number of hours per week [(a)]	4
Weeks per year	52
Hours per year	208
Days per year	26
Day rate [(b)]	2.17
Cost per farmer	56.42
Assumed cash-out	0
Biodiversity (e.g. planting shade trees)	
Tree seedlings	21.08
Tree planting [(c)]	32.24
Share of paid labour [(d)]	28%
Assumed cash-out	30.11
Total cost	109.74
Total cash-impact	**30.11**





Note:
(a) Time assumed to be spent on internal control, keeping records, attending meetings, etc. This amount is an estimate and has not been validated
(b) Day rate used by Victor et al to calculate the labour rate of return. Day rate used is GHc 3.50 (minimum wage is GHc 2.25), converted at 0.62 to US$
(c) Some standards, particularly RA, require planting of shade trees. Cost for seedlings and planting taken from Obiri et al, converted at 0.62 to US$. Victor et al suggest that shade trees reduce productivity, the cost of which has not been taken into account
(d) Taken from Ghana cocoa labour survey: Labour practices in cocoa production in Ghana
(e) Applies to Nigeria

Comments

The cost-impact of certification at the farmer level is poorly documented. Interview feed-back suggests the main costs of certification (training, investments, etc) are covered by pre-financing third parties. Farmers are assumed to invest their time in the process, e.g. for internal controls and meetings. Additionally, some schemes require the planting of shade trees. Although there is an opportunity cost, the cash-impact of these measures is limited.

For the cost of GAP, limited figures are available on the cost of pruning and weeding, which may be considered 'good farming practice'. It is assumed that 50% of this is being done anyway, and that the cash impact is 28% (share of paid labor), which results in a cost of $5.10 / ha.

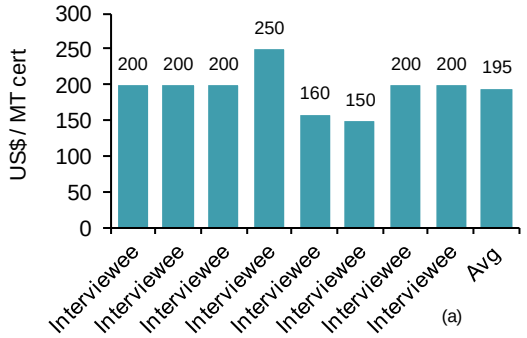
Average yield increase from GAP is taken to be 23%, with the understanding that yield increases take time to materialize (3 years assumed) and are temporary, or even counterproductive, if not combined with increased inputs.

Base-case inputs		
	Assumed value	**Unit**
Cash-impact cert	30	US$/farmer
Cash-impact GAP	5.1	US$ / ha
Delta yield GAP	23	% increae

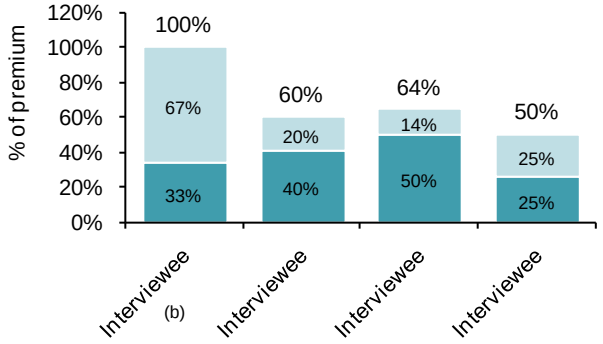
Overview of assumptions

Cash-flow through system

Premium



Share of premium for farmer/coop



> "Traders have to pre-finance a minimum of 2/3 of the certification costs…The other 1/3 is often covered by an NGO, manufacturer or donor…The manufacturer ends up paying more than the agreed premium"

> "The premium partly pays for the costs, but we pass about 60% of the premium to the farmers/coops. Grants cover about ¾ of the remainder of the costs. It's hard to have a business case without the grants"

Note:
(a) Premium for Fairtrade was $150/MT but has changed to $200/MT as of January 2011
(b) In this instance, the costs of certification are likely to be covered by the coop itself, which it recoups through subsequent premiums

Comments

Cash-flows regarding certification appear to be rather untransparent.

The average premium based on feedback is $195

Interview feedback suggests that in many cases an exporter or a third party (e.g. Abrabopa) pre-finances the costs relating to certification and recoups these through the premiums that follow and/or donor funding and/or additional investments by the manufacturer

When the exporter/third-party pre-finances certification, it is assumed that 60% of the premium is passed to farmers/coops, two-thirds of which is for the farmers

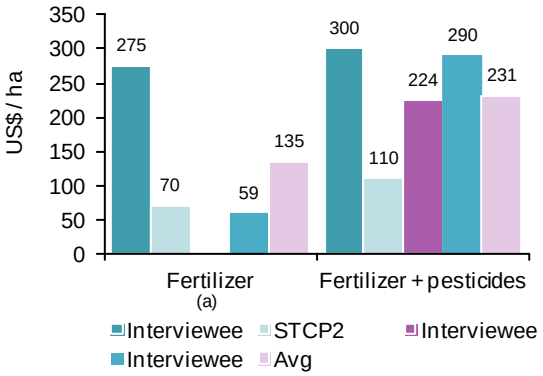
It is further assumed that grant-funding (whether by third-party funders or manufacturers) covers $50 / MT for the first three years

Base-case inputs	Assumed value	Unit
Premium	195	S$ / MT cert
% premium passed on	60	% of premium
Received by farmer	40	% of premium
Received by coop	20	% of premium
Grant funding (first 3 yrs)	50	S$ / MT cert

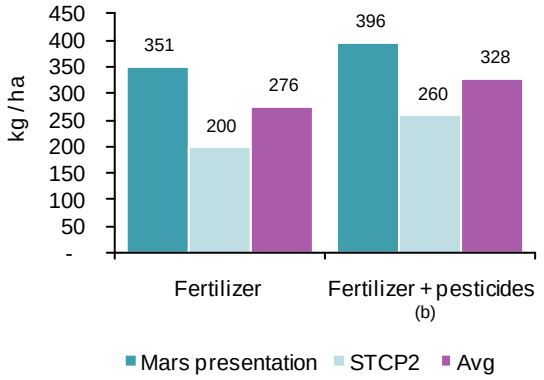
Overview of assumptions

Input financing

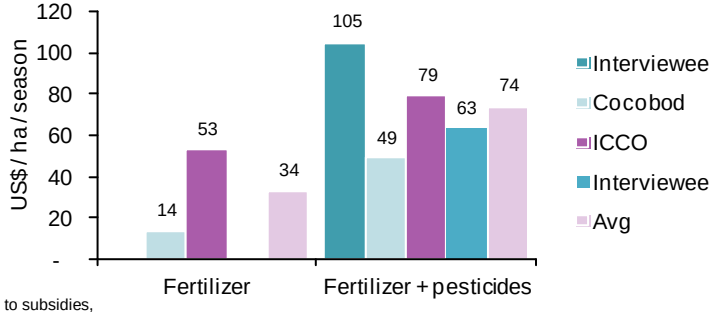
Input costs



Yield improvement



Labour costs to apply inputs



Note:
(a) Fertilizer costs in Ghana are lower than in IC due to subsidies, which has not been taken into account
(b) Interviewee figure based on yield increase resulting from 'knowledge & pest control' – it is assumed that 2/3 of this is due to better practice and 1/3 due to pesticides. Gockowski figure assumes 2ha/farmer
(c) Assumes 3 months credit outstanding per crop cycle
(d) This is the cash-impact, assuming 28% of labour is hired

Comments

Estimations on the costs of inputs and the labor costs for farmers vary significantly. Estimations of yield improvements are more in line with each other.

Below is an overview of the estimates that are assumes as base-case inputs.

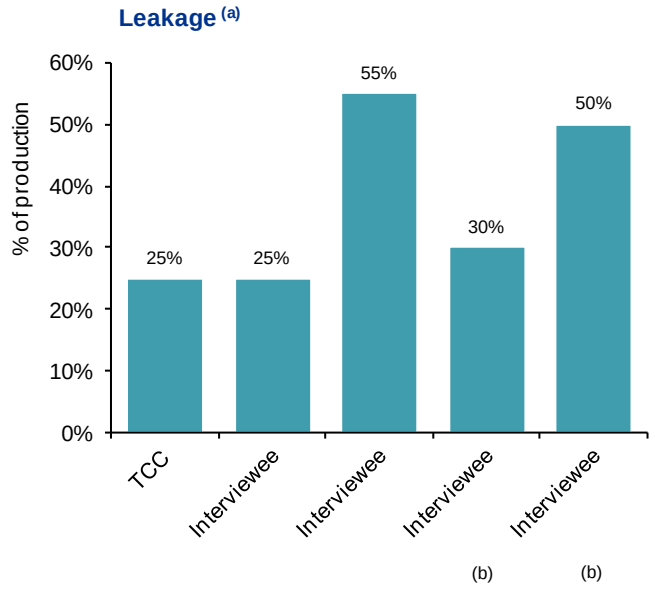
It should be noted that input costs are in part dependent on the local circumstances. E.g. Ghana subsidises fertilizer and has good infrastructure. The yield improvement in turn is dependent on the quality of the trees and the initial level of nutrient deficiency of the soil.

It is assumed that input financing starts in the first year of certification and farmers repay 85% of interest and principle in the first year. In the following years, repayment improves 5% a year.

Base-case inputs	Assumed value	Unit
Fertiliser cost	135	US$ /ha
Fert+pest cost	231	US$ /ha
Interest rate input loan (c)	10	% p.a.
Time loan is outstanding	3	months
Yield chg fert	276	kg/ha
Yield chg fert+pest	328	kg/ha
Labour cost fertiliser (d)	9	US$/ha
Labour cost fert+pest (d)	21	US$/ha

Overview of assumptions

Crop financing



Note:
(a) This excludes another form of leakage that results from a timing issue whereby a farmer may become certified half-way through the year and therefore only produces one cycle's worth of certified cocoa
(b) Interviewee provided two estimates, the lower of which is for 'lead farmers' with a relatively high degree of professionality, the higher is for additional farmers that may be more traditional and risk averse

Comments

Interview feedback suggests a share of certified cocoa is sold into conventional channels due to instant cash-need of farmer or incentives offered by traders such as a piece of soap, equipment or a loan for school costs. It is assumed that leakage is in the order of 30%. Farmers' risk aversion also stimulates them to sell to multiple buyers .

It is further assumed that pre-financing of the crop – thereby facilitating the farmer's cash need – would reduce leakage by 50% over 3 years as it would create loyalty and match incentives provided by other traders.

This crop financing could be facilitated through a 40% first-loss mechanism that reduces the risk profile of financing parties extending crop financing to newly certified farmers with whom they don't have an established relationship. The assumed required return is 15%.

Base-case inputs	Assumed value	Unit
Leakage	30	% of production
Leakage reduction	50	% of leakage
Required return	15	%
Share of turnover that is pre-financed	15	%
Credit outstanding per cycle	13	weeks

Inputs
List of sources (1/2)

Overview of sources used - Literature			
Reference used in report	**Author(s)**	**Title**	**Year**
Literature			
Aidenvironment	Molenar, JW et al	Producer groups models and certification	2011
Aneani et al	Aneani et al	Analysis of economic efficiency in cocoa production in Ghana	2008
CNFA	Owusu, EO	Report on feasibility study on cost/benefit of certification (FT, RA, Utz)	2011
Cocobod	Cocobod research department	Per hectare labour requirements, in: Labour practices in cocoa production in Ghana	2007
FADU	FADU Credit Union	Overview of farming activities	undated
Faostat		Faostat production database	2011
Gockowski	Gockowski, J	The analysis of policies, productivity and agricultural transformation in the cocoa-producing rural economies of West Africa	2007
ICCO	ICCO	Overview of cocoa production costs Nigeria	2008
IDH	Peppelenbos, L	Farmer organization and service delivery	2011
IDS	Asuming-Brempong, S	Mapping sustainable production in Ghanaian Cocoa	2008
Kouamé	Ben-Houassa, KE	Adoption and levels of demand of fertilizer in cocoa farming in Côte d'Ivoire: does risk aversion matter?	2011
Mars Presentation	Raworth, C	Why certification?	2011
Oxfam	Capelle, J	Towards a sustainable cocoa chain	2008
Ruf	Ruf, F	Current Cocoa production and opportunities for re-investment in the rural sector	2007
STCP1	STCP	Phase II program document	2006
STCP2	McKinsey	STCP baseline survey, in: Exploration of opportunities West African cocoa	2008
TCC	Tropical Commodity	TCC Cocoa Barometer 2009	2010
TCC	Tropical Commodity	TCC Cocoa Barometer 2010	2010
Victor et al	Victor, A-S	Economic cost-benefit analysis of certified sustainable cocoa in Ghana	2010

List of sources (2/2)

Overview of sources used - Interviews			
Reference used in report	**Organisation**	**Interviewee**	**Year**
Interviews			
Interviewee	CNFA	Takyi Sraha	Aug-Oct 2011
Interviewee	Continaf	Herma Mulder & Merijn de Veere	Aug-Oct 2011
Interviewee	Ecom Trading	Cédric van Cutsem & David Rosenberg	Aug-Oct 2011
Interviewee	GIZ	Eberhard Krain	Aug-Oct 2011
Interviewee	IDH	Matthieu Guemas	Aug-Oct 2011
Interviewee	Mars	Peter van Grinsven	Aug-Oct 2011
Interviewee	Max Havelaar	Peter d'Angremond, Alien Huizing & Jos Harmsen	Aug-Oct 2011
Interviewee	Rainforest Alliance	Eric Servat	Aug-Oct 2011
Interviewee	Socodevi	Mario Boivin	Aug-Oct 2011
Interviewee	Utz Certified	Daan de Vries & Beatrice Moulianitaki	Aug-Oct 2011
Interviewee	Wienco	Henri Wientjes	Aug-Oct 2011

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