The 2020 Roadmap to Sustainable Indonesian Cocoa

Final Report

Commissioned by the Cocoa Sustainability Partnership

NewForesight

16-Dec-13

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Preface

This report[1] is prepared by NewForesight Consultancy upon request of the Cocoa Sustainability Partnership (CSP) to deliver a roadmap towards a sustainable Indonesian cocoa sector in 2020, endorsed by all CSP members.

This version you are reading is the final report for this assignment. It was approved by the members of the Roadmap Taskforce and finalized with input from the members. The content of the report is based on a wide-ranging consultation of nearly all CSP members and the most prominent cocoa experts of Indonesia, as well as desk research and analysis.

The report has been prepared under the supervision of the CSP Task Force (chaired by Ms. Rini Indrayanti) by a team including Mr. Joost Gorter (project leader), Mr. Bart Vollaard, Ms. Wati Chaeron, Mr. Marc Argeloo and Ms. Silvana Paniagua. Many thanks go to the CSP members, cocoa experts and Indonesian farmers that have been consulted during the process of report preparation (see Annex 7 for the list of people consulted). The content of the roadmap and the report have benefited greatly from their critical inputs. Our special thanks goes to the CSP Secretariat team for assisting our consultants during the consultation process in Indonesia as well as during the entire course of the project.

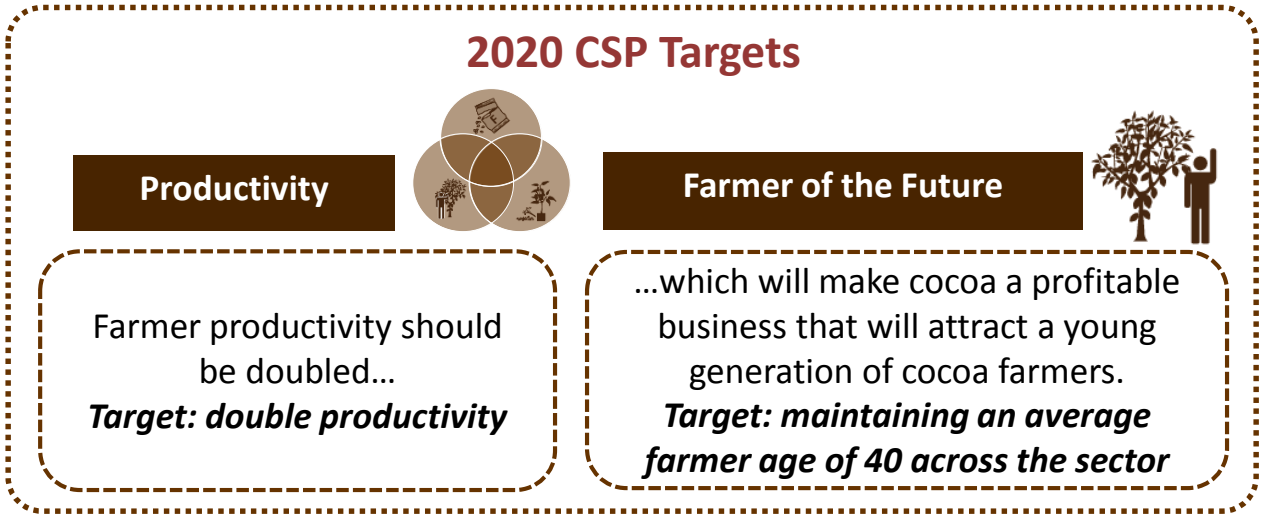
We hope this Roadmap is the start of a process that will unite the CSP members in making the Indonesian cocoa sector truly sustainable.

Lucas Simons – Director, NewForesight Consultancy

8 December 2013

[1.] Suggested citation: Cocoa Sustainability Partnership (2013), *The 2020 Roadmap to Sustainable Indonesian Cocoa.* Prepared by NewForesight Consultancy, Makassar, Indonesia

What is the CSP 2020 Roadmap?



This Roadmap is built around the 2020 Targets for the Indonesian cocoa sector, as formulated by CSP members. The members decided that for the cocoa sector to become viable again farmers have to double their productivity (and increase their quality) in a sustainable way (not by using more land). This will attract the next generation of cocoa farmers to the sector, halting the process of aging that is currently taking place in the cocoa sector.

It was agreed by CSP members to work on establishing a credible CSP baseline to establish what current productivity levels are, and to be able to measure whether the sector is succeeding in reaching its goals, as well as assessing what interventions work well and where improvement is needed.

The Roadmap is built around the farmer. Only by building a business case for the farmer will the Indonesian cocoa sector regain its vitality. Otherwise the (more talented) farmers will continue to switch to other crops.

How to Read the CSP 2020 Roadmap?

This Roadmap is a combination of things. It first of all marks an agreement of the stakeholders to collectively address what is necessary to double productivity and attract the next generation of cocoa farmers. How this is done will be the key next step in this process. This Roadmap provides input into that process. It captures the consensus among the stakeholders, which they will now have to follow up on in their interventions. How that could be done is informed by the recommendations (not part of the consensus but supported by at least a majority). Stakeholders should ask two questions, rather than look for confirmation of their activities:

1. If I continue like this, will we collectively double productivity? If not, what do I need to change.
2. If I want to be part of changing the sector how can I contribute to the Roadmap recommendations in addition to what I am doing. Specific recommendations on roles and responsibilities are given below.

Companies are the final client in the value chain from this Roadmap perspective. Their key role will be to use a series of (Roadmap related) KPIs to which they hold their service providers (NGOs, processors/exporters) accountable. In addition they can play a key role in financing those areas that are non-competitive.

Processors/exporters will compete on implementing the best practices in the context of this Roadmap. They will have to take the lead on formulating what are the areas that are non-competitive (to them) and where joint action is possible.

NGOs will raise their level of ambition and think how their solutions function at scale. They have to commit to providing the comprehensive resource package to the farmer, including business principles and access to finance.

Donors will fund sector development in line with the Roadmap Agenda.

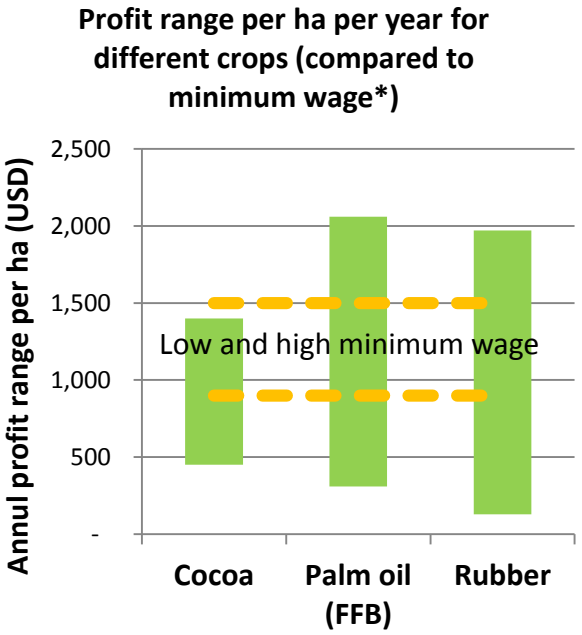
Sector institutions will take the lead in organizing the actions that relate to the enabling environment and coordinate the implementation of the Roadmap.

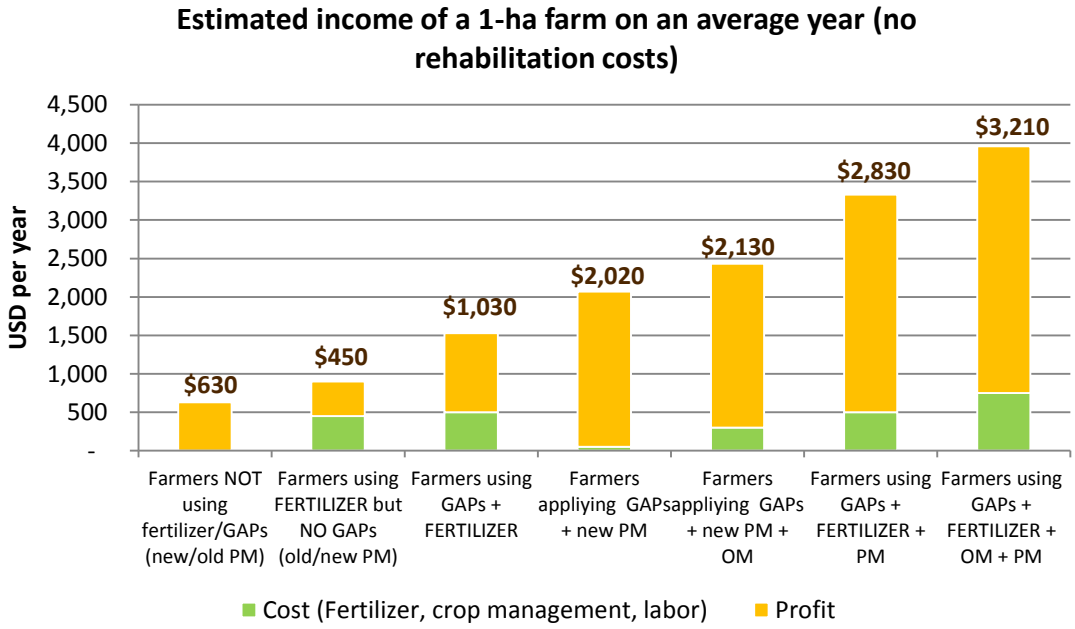
Government: If this Roadmap is the request from the sector: how does it correspond to government priorities, and where it overlaps how can the government further support this Roadmap beyond its existing commitments? Will the government adopt the effort to double productivity as its own?

The business case for the cocoa farmer

The business case for the Indonesian cocoa farmer is not a straightforward one. It compares unfavourably to palm oil (and other crops) in many ways. The diagram on the left illustrates this. But there is a business case to be made, as the diagram on the right demonstrates. For the farmer to make a competitive profit, however, he has to make use of a combination of GAPs, quality inputs (notably fertilizer) and high quality planting material.

This roadmap lays out a path towards organizing the Indonesian cocoa sector so that a critical mass of Indonesian cocoa farmers produces their crop in a way that allows for the farmer to make a competitive profit. Providing the farmer with access to the required resources (Professional Farming Package) is key in this.





Main consensus points

Below are the main consensus points of the Roadmap: those points that the CSP stakeholders agreed upon were necessary to double productivity and attract the next generation of cocoa farmers.

- There is an underlying understanding in this roadmap that success will be determined by **working with the top farmers in the sector**. The sector will have to be organized to facilitate access to the **Professional Farming Package** for these farmers. **Targeting** will thus have to be a key component in any strategy. Best practices will then trickle down into the sector via "copy-cat" behavior. Not all farmers will have to be trained; the right farmers will have to be trained.
- But **training** will remain key. For this to be done at scale, a serious investment will have to be made in training the trainers *of trainers*. These are currently in undersupply. This is a major bottleneck. A minor part of this can be resolved by working closer with **extension services**. A major component will be to equip **top-performing farmers** to make a business out of providing services to the farmers around them. Organizing farmers in **cooperatives** (at scale) is the final piece to this puzzle.
- **Fertilizer** is the key to unlocking the higher levels of productivity. Currently fertilizer is underutilized. This will have to be addressed. The main factor in this will be knowledge. If farmers understand why they should use fertilizer, what fertilizer they should use and how, it is expected to provide the pull factor that will build a functioning fertilizer market in Indonesia. But for that to happen the question of **access to finance** will have to be addressed first. Farmers need to be able to finance the fertilizer as it is quite an investment. This also underlines the point that **business principles** will need to be a core component of training programs.
- **Planting material** is the third component of the Professional Farming Package. It is widely available but new and better varieties need to be fed into the sector at scale, to reach the desired doubling of productivity in 2020.

Main recommendations

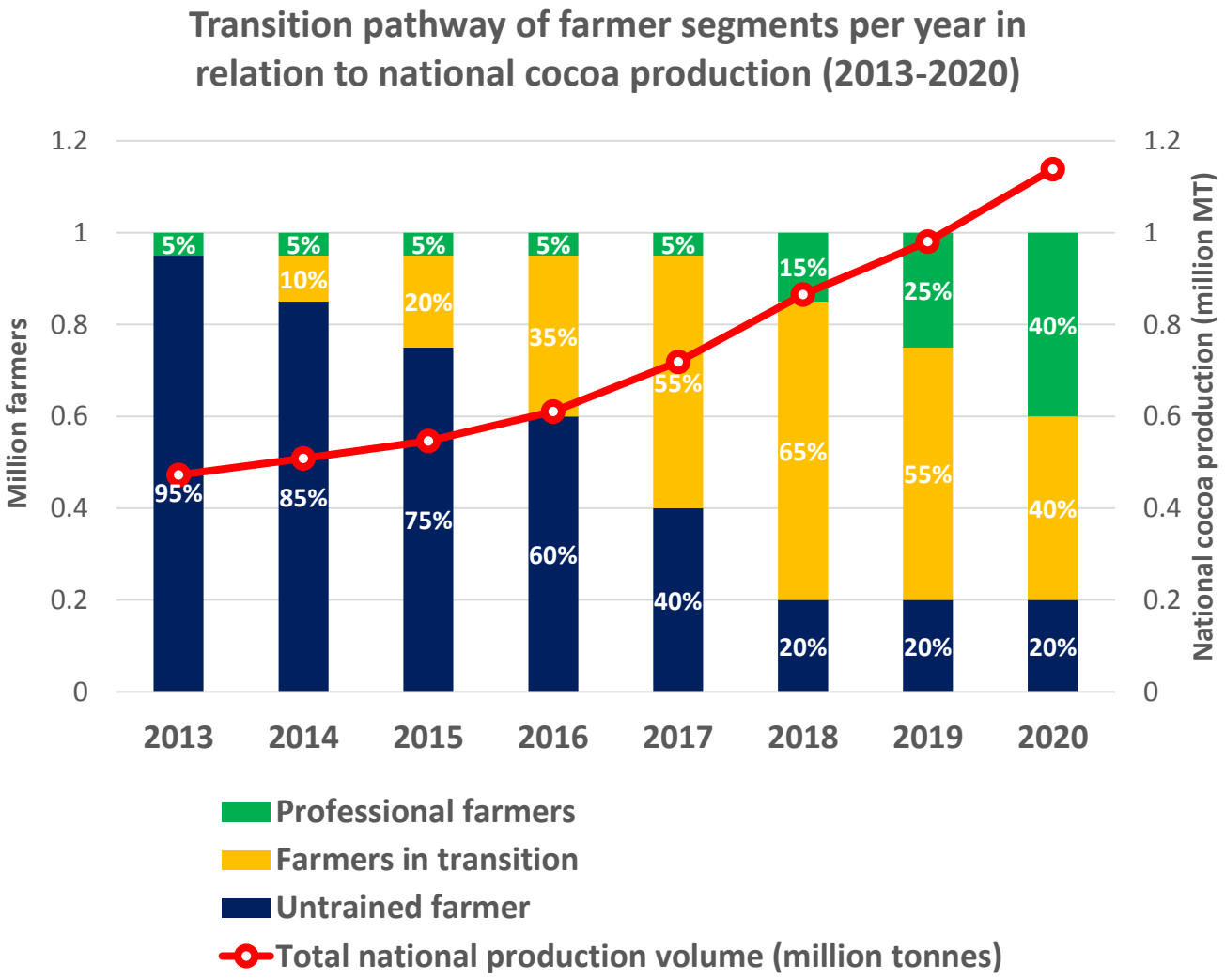
Focus Area	Recommendation
Agro-inputs	• Fertilizer needs to be rolled out at scale. There is currently a lack of knowledge and consolidated action. A coalition should be made, including fertilizer companies; this knowledge gap should be addressed and trigger product innovation.
Planting material	• The large scale effort that is currently underway needs to be complemented with a rolling out of better clones for farmers and nurseries to graft at scale, building on their capacities.
Knowledge	• GAP modules are solid. They could perhaps benefit from further standardization but key will be to integrate **business principles**.
Modes of delivery and organization	• The entrepreneurial spirit of the farmer has to be stimulated and built into delivery models. • This has to be combined with large scale farmer organization, organizing cooperatives around delivery of the Professional Farming Package.
Access to Finance	• Financial institutions should be involved in large scale initiatives involving the broader value chain.
Role of the government	• The government can play a key role in organizing and mobilizing at the district level and creating a beneficial policy framework at the national level (eg. for access to finance and enhance extension services).

Transition pathway of farmer segments and national production

By applying a phased approach and targeting strategy to get 40% of the total farmer population to be a 'Professional Farmer' (fully trained) and 40% 'Farmer in Transition' (in training) by 2020, the national cocoa production of Indonesia is estimated to reach to more than 1 million tons in 2020 (see figure).

The figure shows the phased approach of the transition pathway. Each year an increasing number of farmers are enabled to start adopting the Professional Farmer Package.

The numbers shown in the graph assume successful adoption only. For that to happen, industry will have to take into account the diffuse nature of input distribution and training retention rates when calculating the necessary investments.

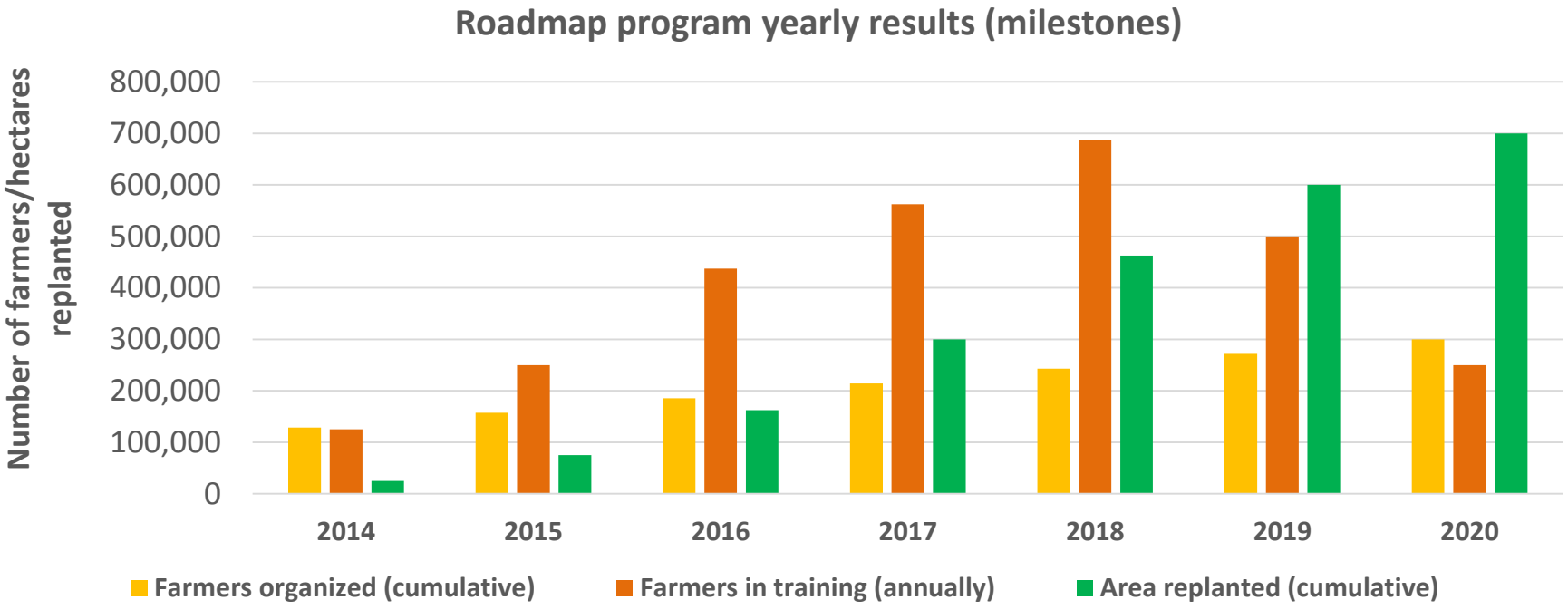


Organizing the delivery of the Professional Farmer Package: *level of effort - milestones*

The level of effort required to reach the CSP 2020 targets can be translated in annual milestones.

The graph below shows:

- How many farmers have to be organized yearly towards 2020 (cumulatively)
- How many farmers will be in the 4 year Professional Farmer Package training program each year
- How much land has to be replanted with improved planting material annually (cumulative)



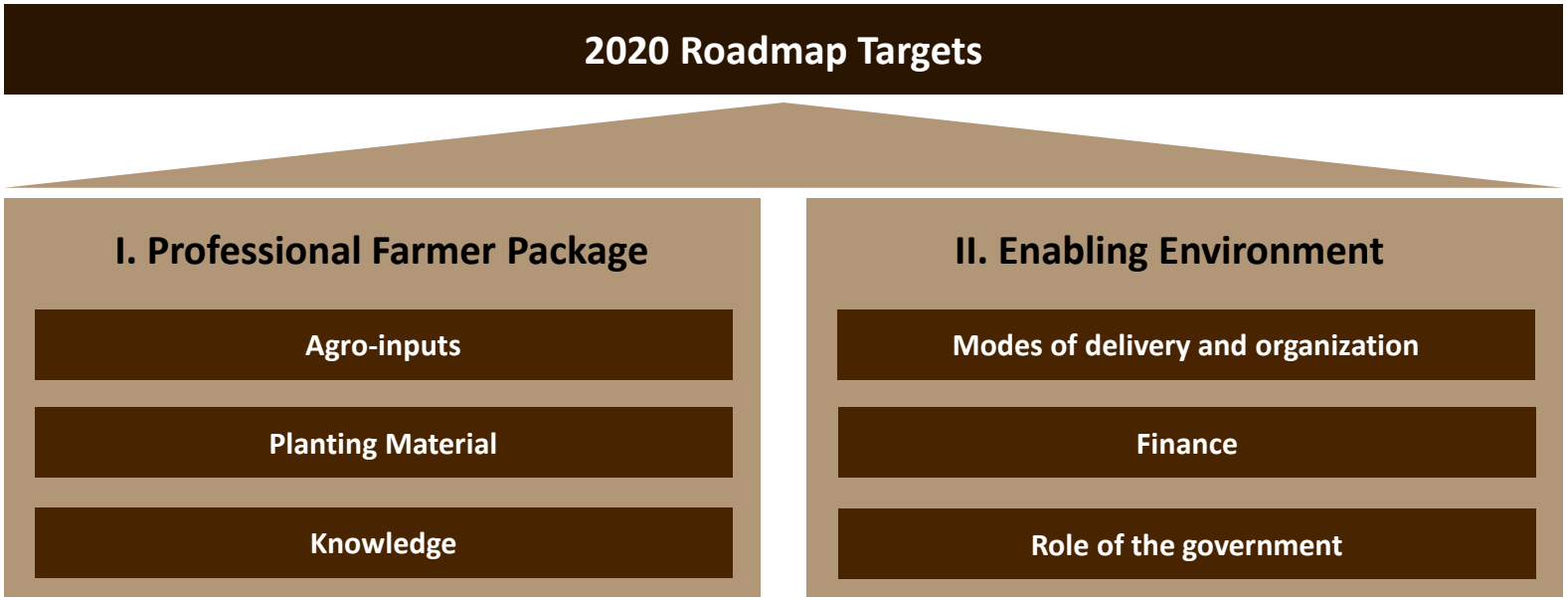
Roadmap Structure

Roadmap rationale & overview

The Roadmap Framework: How to build a profitable business for the farmer

The previous chapter summarized the necessary ingredients to make a viable business case for the Indonesian cocoa farmer. Enabling the conditions for a competitive and sustainable cocoa farmer business case is essential to reach the 2020 Roadmap targets set by the CSP.

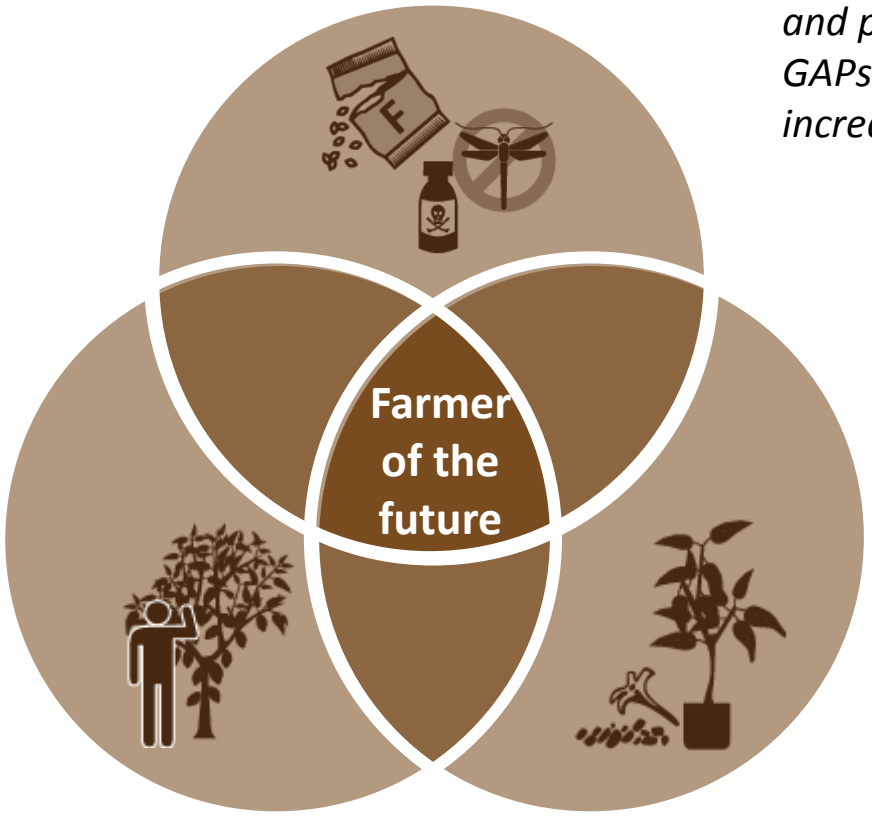
For the targets to be reached by 2020, there is a road to go still by all stakeholders involved. This road consists of two (interrelated) pillars: 1) the Professional Farmer Package, consisting of the building blocks 'Agro-inputs', 'Planting Material', and 'Knowledge', and 2) an Enabling Environment, consisting of 'Modes of delivery and organization', 'Finance' and 'Role of the government'.



2 tracks – 6 building blocks

Roadmap rationale & overview

Track 1: The "Professional Farmer Package"



By increasing the appropriate use of quality agro-inputs and plant material, in combination with knowledge on GAPs and business management skills, yield will be increased across the sector…

…and few farmers will remain in their unproductive state.

Defining the building blocks

Track 1: The Professional Farmer Package

Agro-inputs

=

A set of productivity enhancing agricultural inputs (addressing availability, use and quality of), i.e:

- Fertilizer (including compost): organic or inorganic material added to a soil to supply essential plant nutrients and improve soil health and structure.
- Pesticides: chemical or biological agents to fight and control cocoa pests (e.g. insects, fungi, weeds) and disease

Planting Material

=

The availability of (approved and affordable) planting material to farmers, including:

- Propagation models (e.g. seeds, grafting, cuttings, somatic embryogenesis)
- R&D of high-yielding, pest-resistant cocoa clones
- Nursery development (for cocoa and shadow/fruit trees)
- Approval and quality control of clones and nurseries

Knowledge

=

A training package providing all necessary knowledge & skills for the professional Indonesian cocoa farmer, including:

- Good Agricultural Practices (GAPs) for sustainable cocoa farming (incl. proper use of agro-inputs, planting material)
- Business & management skills (incl. financial management and farmer organization)

Track 2: the Enabling Environment

If inputs, technology and knowledge that need to be transferred to farmer are known…

… then the questions are:

- How to organize this transfer most effectively in terms of supply (of inputs) and service delivery to farmers to improve their business case;
- How to target the right (= high-potential) farmers;
- How to organize farmers most effectively for this purpose, maximizing their income;
- How to finance it (across the value chain);
- What role the government should play in this.

The enabling environment chapter of the roadmap will address these questions.

Defining the building blocks

Track 2: The Enabling Environment

Modes of Delivery & Organization =

The possible modes of delivery and organization to enable and maximize the effective, large-scale adoption of best available agro-inputs and knowledge. This includes organizational networks (e.g. extension services, farmer organizations, value chain partners) as well as modes of communications and training

Access to Finance =

The access to financial resources for farmers in order to allow them to finance the Professional Farmer Package and other long-term investments, addressing for example:

- Different models for agri-finance
- The roles of banks and value chain partners

Role of the Government =

To seek reinforcement of the CSP Roadmap by the Indonesian government where possible, including:

- Alignment and synergies with government policies
- Sharing responsibility and resources
- Coordination and communication with local and national government

What are the roadmap sections comprised of?

The Roadmap analysis can be found in the annex. What follows is a summary of the consensus points among CSP stakeholders, and the main recommendations by the consultant (based on a critical mass – but not all – of the CSP members agreeing on their need).

Structure of the Roadmap as a whole:

- Background – *in annex*
  - Background on the topic, incl. headline issues, history, etc.
  - Current practices and status quo
- Options (not present for all components) – *in annex*
  - Which issues still need to be tackled?
  - Which practices are out there?
  - What are the differences between approaches and their consequences?
- Consensus – *in following chapter*
  - Issues and approaches on which the CSP members agree
- Recommendations – *in following chapter*
  - Option(s) recommended to the CSP by the consultant

The Key Performance Indicators and Financial Implications of the Roadmap can be found in the at the end of each of the 'building block' sections.

Building block:

Agro-Inputs

The Professional Farmer Package

The importance of appropriate farm nutrient management is agreed upon

- It is important that farmers apply a mix of organic and inorganic fertilizers.

- Farmers should learn to use fertilizers in mixes, quantities and frequencies that are appropriate for cocoa trees and their environment.

- A compound fertilizer should be designed that needs the specific needs of cocoa.

- Farmers and farmer organizations need access to financing possibilities for the appropriate fertilizers and/or to subsidized fertilizers.

- Farmers should learn how to produce organic fertilizers out of their waste products, and how to correctly apply them.

- Farmers have to learn business skills to see farming as a (viable) business, and the fact that it needs inputs in order to generate outputs.

Recommendations

Fertilizer and farm nutrient management reaching trained farmers: improvements to be made

Recommendations	Actions
Innovate in producing effective fertilizer (locally)	• Involve local actors in the fertilizer industry • Develop the proper formula for a cocoa-specific compound fertilizer
Invest in quality training on fertilizer use	• Make fertilizer application a prominent component of GAP package • Demonstrate effect of fertilizer use to farmer • Teach farmers about the business case for fertilizer use
Solve the problem of large-scale soil acidification	• Promote and enable soil liming of acidified cocoa farms on a large scale
Strengthen farmer organizations to access and buy fertilizer collectively	• Stimulate farmers to be organized • Increase efforts on farmer organization strengthening
Address access to finance for fertilizer purchase	• Explore options for supply chain pre-finance (see 'access to finance' section) • Involve government to reform subsidy schemes to reach target farmers and get effective distribution
Invest in marketing of cocoa-specific fertilizer and its beneficial properties	• Find channels through which to inform farmers about the appropriate fertilizers on the market • Cooperate with farmer extension service providers • Make cocoa-specific fertilizers affordable and available to farmers

Consensus

Pesticide use should be used effectively and responsibly

- There is a general concern about the current excessive and ineffective use of pesticides. These concerns involve health and environmental issues, input ineffectiveness and crop loss. All stakeholders agree that action is needed regarding these issues.

- The CSP members agree that farmer should have access to those pesticides and methods that can adequately solve their pest and disease problems, while minimizing health and environmental conditions as much as possible.

- Stakeholders recognize the need for farmers' knowledge on the following topics:
  - Identifying and understanding pest and disease
  - Necessary skills for appropriate pesticide application (including methods that may make pesticide use obsolete on some occasions)
  - Negative health and environmental impacts

Recommendations

Clear guidelines and training should control pesticide use

Recommendations	Actions
Training programs should include responsible pesticide use	• Clear inclusion of responsible practices in training manuals and adaptation
Consensus on good practices	• Need for common consensus on chemical fertilizer application and maybe certain bans (e.g. within guidelines of international conventions and WHO)
Adoption of innovative methods	• Increasing attention to development and promotion of the next generation of pesticides (incl. safer and more target-specific pesticides, organic pesticides and natural predators)
Long term: move towards biological methods	• Promote the adoption of organic alternatives and natural pest predator methods

Building block:

Planting Material

The Professional Farmer Package

Consensus

Focus on rehabilitation schemes for broader impact of improved PM

- CSP members agree that while the PM propagation and distribution structure in Indonesia is relatively effective the impact of using better varieties would be significant.

- Considering farmers only choose new PM every 20 years the cost of PM itself are limited. The real costs related to PM involve broader rehabilitation schemes (see business case chapter).

- The need for rehabilitation remains high and farmers do not easily engage in rehabilitation at scale

- Farmers should be encouraged to rehabilitate their cocoa area via demonstration of high-yielding varieties.

- The scale of rehabilitation should be determined by the financial capabilities and knowledge of the farmer

Recommendations

Thinking of the longer term

Recommendations	Actions
Beef up research effort	• Engage in further research on PM, specifically related to pests and disease resistance. Ensure precompetitive sharing of new varieties.
Bring in genetic material from other countries	• Much is to be gained by introducing more varieties from abroad in Indonesia (after careful testing in local context).
Work with the capacities of farmers	• While the role of the government in certifying and the role of nurseries in distribution is acknowledged, farmers can provide grafting services for fees.
Diversified nurseries	• Nurseries should provide for the entire farming operation (including shade trees).

Building block:

Knowledge

The Professional Farmer Package

Consensus

Farmers need GAP and business knowledge to create successful farms

- Basic GAPs (especially PsPSP) are essential for healthy cocoa farms and should be known and applied by all farmers.

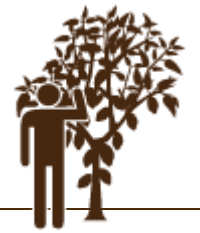
- Applying GAPs could greatly increase farmer productivity without large financial investments or environmental strain.

- Business management skills are not widely taught to farmers, yet are vital in order for them to treat their farms as efficient businesses.

- With business management skills farmers can learn to understand the business case or a productive cocoa farm and the investments they need to make in order to create the most efficient and productive farm.

Recommendations

Farmer training curriculum should be supported by the sector



Recommendations	Actions
Determine a sector-wide supported curriculum	• Determine the broadly supported GAPs and management practices in detail • Determine how advanced GAPs should be included
Make business skills a common component of training manuals	• Include financial bookkeeping, cocoa production logbooks and general financial literacy into the standard curriculum of cocoa farmers
Uncouple training manuals from certification efforts	• Develop manuals separately from certification training programs in order to reach other farmers and focus on a greater variety of GAPs
Determine how training modules will be used	• Choose whether training modules/content is fixed per training or if some are optional • Choose for a top-down (service provider decides training curriculum) or bottom-up approach (farmer decides curriculum)

Building block:

Modes of Delivery and Organization

The Enabling Environment

Consensus

Good extension service methods are essential

- Extension services and training play a pivotal role in achieving the roadmap's productivity targets.

- There is a high need to increase the number and capacity of trainers and extension agents by all stakeholders.

- The existent networks should be leveraged for dissemination of knowledge and inputs.

- Public-private partnerships in extension services should be promoted.

- Quality and continuity of training are key, preferably to smaller groups of farmers (20-30).

- Extension interventions should be able to provide access to all components of the Professional Farmer Package by cocoa smallholders.

- Monitoring and evaluation of the uptake and effectiveness of extension services is essential and should be a standardized practice in all programs

Recommendations

Support entrepreneurial spirit and explore new extension methods

Recommendations	Actions
Increased training and support to extension agents	• Training the right profile of entrepreneurial business men and women • Develop self-sustaining business models around planting material and the distribution of agro-inputs • Involve public extension agents
Explore involving local trader networks and buying stations	• Stimulate buying stations to expand training to productivity increasing practices and input use • Explore the role of local trader networks and interests
Support participatory extension approaches and virtual learning	• Support farmers' own initiatives, experiments and requests • Explore using a virtual hub as a knowledge sharing platform
Monitoring and evaluation as standard practice	• Introduce M&E aspects on impact and adoption or extension services into existing programs • Make M&E standard practice on all CSP initiatives in order to evaluate effectiveness and progress

Building block:

Access to Finance

The Enabling Environment

Consensus

The hurdles that inhibit farmers' access to finance need to be removed

- Access to finance for cocoa farmers in needed to achieve the roadmap targets
- Banks need to be sensitized to the cocoa farmers' conditions
- Farmers' lack of collateral, track record and financial illiteracy need to be addressed
- The high interest rates of micro-sized loans typical for cocoa farmers and their struggles with repayment rates should be tackled
- Local institutions need to be involved more, and farmer organization promoted and strengthened (including portfolio building and complementary technical assistance)
- Opportunities of supply chain pre-financing should be explored
- Transaction costs need to be lowered (e.g. through mobile technology)
- Loan guaranties through public-private partnerships can be explored in order to develop new models

Recommendations

Take farmer finance to the next level

Recommendations	Actions
Banks need to be involved in smallholder financing	• Make the business case for banks and financial institution • Capacity building of banks and financial institutions to make them understand tree crop value chains
Private sector can provide pre-financing to farmers	• Financing schemes should follow smart sequencing, which means proper timing of financial support in combination with technical assistance • Ensure value chain engagement, e.g. through contracts with farmer groups or pre-financing
Focus on organizing farmers	• A necessary condition are strong, bankable, self-initiated and self-motivated farmer groups

Building block:

Role of Government

The Enabling Environment

Consensus

Engaging the government at national and district level

- CSP stakeholders agree that one of the main keys to the success of this roadmap is the alignment with the Indonesian government through constant dialogue with the relevant government departments at national and local levels. Of specific relevance are the government-led district clusters, whereby local fora mobilize a coalition around action plans to improve the viability of the cocoa sector in a certain district.

- For the respective chapters of the roadmap policy support should be sought. Specifically this is relevant for the agro-inputs chapter (on fertilizer), the planting material chapter (research and regulation), and the modes of delivery (inclusion of extension services in training activities).

- Getting the government involved in working on data gathering and sharing (with regards to the CSP baseline) will be crucial to successful measurement of roadmap implementation performance.

- If a single area of government financial support could be singled out it would the facilitation of access to finance for cocoa farmers.

Recommendations

Getting the government involved

Recommendations	Actions
Integrate extension services into training delivery	• Training programs should integrate government extension services, building up their capacity to provide independent quality service delivery.
Work with the government on district-level policy formulation	• Work with the government on convening local cocoa sector stakeholders at the district level to formulate cocoa cluster action plans.
Set up a data gathering working group	• Convene a working group that includes the government to focus on improving joint data gathering/reporting.
Integrate action plans of CSP roadmap and government agenda	• Convene a high-level government working group (preferably permanent) that aligns the roadmap with the government agenda. Existing bodies such as PisAgro could be employed for this purpose.

Annex 1: Background

Background of the CSP Roadmap assignment

The Cocoa Sustainability Partnership (CSP) is a public-private forum for the advancement of communication and collaboration between stakeholders actively engaged in cocoa development initiatives in Indonesia, for the mutual benefit of all cocoa sector players.

Cocoa is an important commodity in Indonesia, especially since more than 1 million smallholders and their livelihood rely on this commodity. However, in recent years, the cocoa sector in Indonesia has been impacted by problems that have decreased the productivity and production of cocoa. Furthermore, these conditions have negatively affected farmer income and their livelihoods, and have caused many farmers to lose their interest in cocoa farming. Problems faced by farmers are pests and diseases, aging trees, poor soil management, and limited cocoa farming skills.

To address these issues and to ensure the sustainability of the cocoa supply chain, initiatives to improve the cocoa conditions have been developed in Indonesia by various stakeholders in the value chain, namely private sectors, NGOs, government, academics and research agencies. These programs are aiming to increase productivity and production of cocoa through improving farmer's capacity on cocoa farming, better access to inputs and by establishing a pro-farmer business environment. Although there are improvements witnessed on the farming conditions and production of cocoa, they are still insufficient to achieve targeted farm productivity levels.

The CSP and its member agreed to improve alignment of these efforts in order to speed up the achievement of those goals. Therefore, in the March 2013 General Assembly meeting, CSP members have agreed to establish a 2020 Vision and develop an actionable roadmap towards this Vision.

NewForesight Consultancy was commissioned by the CSP to create an actionable Roadmap to an agreed 2020 vision for a sustainable cocoa supply chain in Indonesia, supported by and aligned with relevant stakeholders in the cocoa sector. This document is the final result of that assignment.

The assignment: 2020 roadmap for the Indonesian cocoa sector

Actionable roadmap

Contains:

- Integrated set of priorities to be translated into actual programs
- No program design but clear programmatic implications

Inclusively endorsed

By:

- The broad group of CSP stakeholders
- Future participants will take the Roadmap as a guiding document to structure their programs accordingly

Nationally relevant

For:

- The entire Indonesian cocoa sector without specific focus on any particular region or group of stakeholders

Introduction

The 2020 roadmap work process consisted of four phases

Phase 1: Desk research

Phase 2: Consultation / workshops

Phase 3: Report writing

Phase 4: Final presentation

Desk research

Analysis of sustainable cocoa programs in Indonesia

First round of consultation of CSP Task Force and Board

Analysis of competitiveness of cocoa vs. other crops

August

Gather technical input & build consensus

Individual consultation of CSP members

Task Force meetings

CSP GA Meeting

September

Additional research & consultation

Recommendations & resources to achieve Roadmap milestones

Write draft report of the 2020 Roadmap

(*Review of draft report by CSP*)

October/November

Adjustment of the draft report after CSP revision

Delivery of final report

Presentation of final Roadmap at CSP GA meeting in December

December

Annex 2:
Targets and Measurement

The 2020 CSP Roadmap targets: a tiered, measurable approach

(as agreed during September 2013 GA)

Definitive 2020 CSP Targets

Productivity

Farmer productivity should be doubled…
Target: double productivity

Farmer of the Future

…which will make cocoa a profitable business that will attract a young generation of cocoa farmers.
Target: maintaining an average farmer age of 40 across the sector

Level of ambition

Production

To make Indonesia the number 1 global producer in a sustainable way

Strategic targets (KPIs)

Increase in productivity x <u>higher quality</u> = <u>higher income</u> for the farmer

quality + productivity = income + land intensif.

Increase in productivity x <u>no further deforestation</u> = higher production

- These targets will have to be made more specific as the CSP defines its overall KPI framework
- Additional strategic targets will then be set as well, based on the content of this Roadmap (suggestions are made in this document)

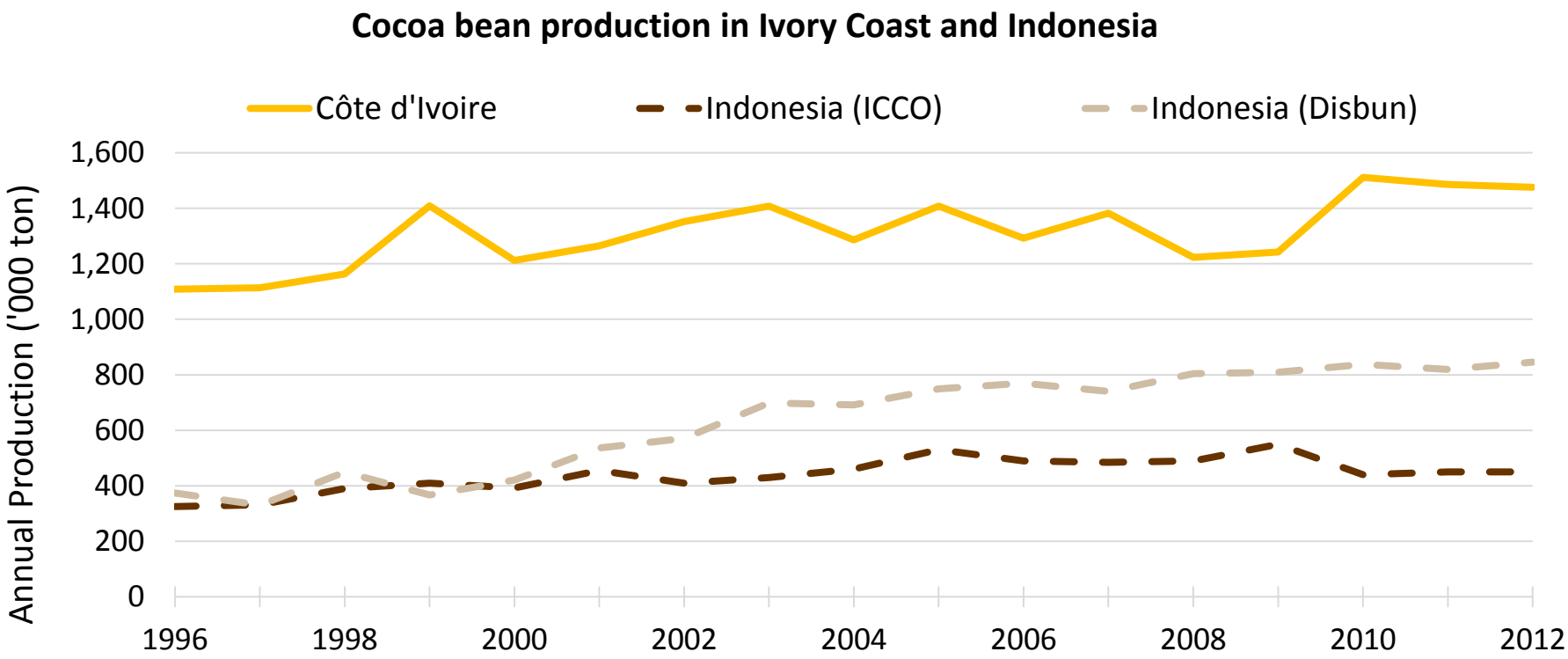
The data problem: how to measure the success of this Roadmap?

Indonesian cocoa production statistics vary per source…

Annual production 2012 = **450.000 ton** (*ICCO*) - **845.000 ton** (*Direktorat Jenderal Perkebunan*)

…but stakeholders agree: doubling yield is maximum feasible target for 2020.

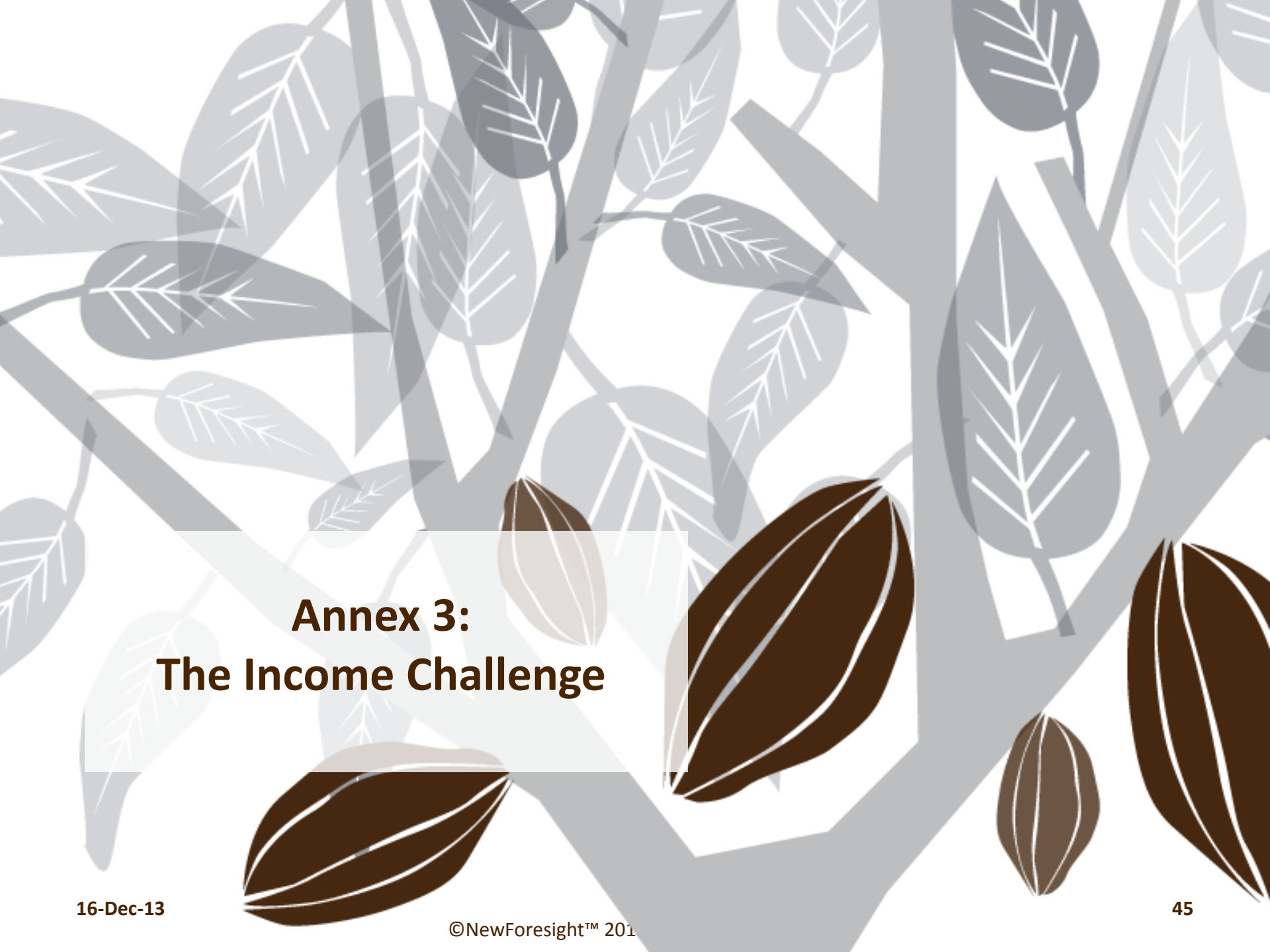
This would make Indonesia the No. 1 producer according to government statistics



Good data is key: establishing a CSP baseline

It was agreed by CSP members to work on establishing a credible CSP baseline, which will allow:

1. Accurate and transparent measurement of success
   - CSP members have a shared understanding of how they are doing in reaching the 2020 targets. This would allow CSP members to discuss actual progress and impact
2. Calculating the level of effort required for success
   - CSP members will have an understanding of what level of effort is required to reach the 2020 targets: both in terms of what to do and how much of it;
3. Comparing interventions for optimization
   - CSP members will see what interventions are working and which ones can be improved based on the lessons they share through the forum;
4. Collaboration with government to improve quality of data jointly
   - Together the CSP and the government could work on improving data gathering across the country, and how to effectively share information across districts and stakeholders;
5. Integration with global measurement systems for global benchmarking
   - Making use of global data systems such as CocoaMAP will allow for benchmarking of CSP performance against KPIs that are measured in other production countries.



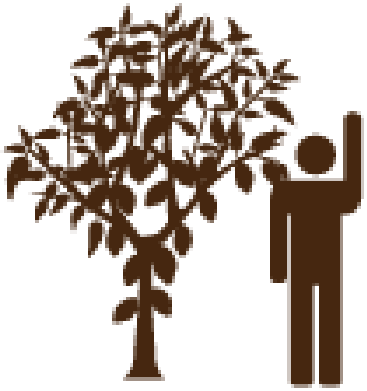
Annex 3:
The Income Challenge

The income challenge

The Indonesian cocoa farmer today

	Smallholders *(Perkebunan Rakyat)*	State-owned companies *(Perkebunan Negara)*	Private companies *(Perkebunan Swasta)*
Share in national cocoa production	**92%**	**4%**	**4%**
Share in cocoa plantation area	**95%**	**2.5%**	**2.5%**

Source: Directorate General of Estate, 2013 (preliminary data 2012)



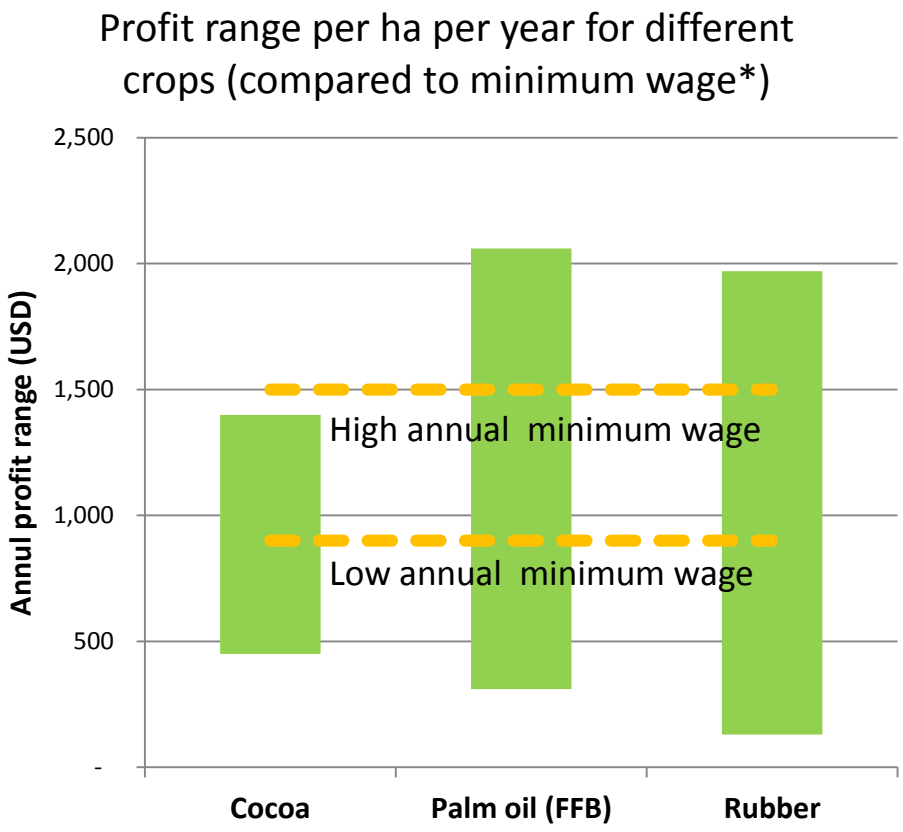
The Indonesian cocoa smallholder *

- **Total number: 1 - 1.6 million**
- **Small farms dominate** – average size ± 1 ha
- **Farmers are getting older** – average today: ± 42 years
- **Cultural profile:** the Indonesian cocoa farmer is (from a global perspective) relatively skilled, entrepreneurial and dynamic. As such he is likely to switch to other crops if he believes a higher income can be obtained.
- **Productivity is at a level that does not make for a viable income at 500 kg/ha/year**.
- **Therefore farmers are switching to other crops (notable palm oil) at an alarming rate.**

The challenge of this roadmap is to provide sufficient income (relative to other sources) to draw the next generation of cocoa entrepreneurs.

**Based on NewForesight interviews & analysis; Swiss Contact 2013; Neilson et al., 2011; Hafid et al., 2013*

Is cocoa a crop of the future… or will other crops prevail



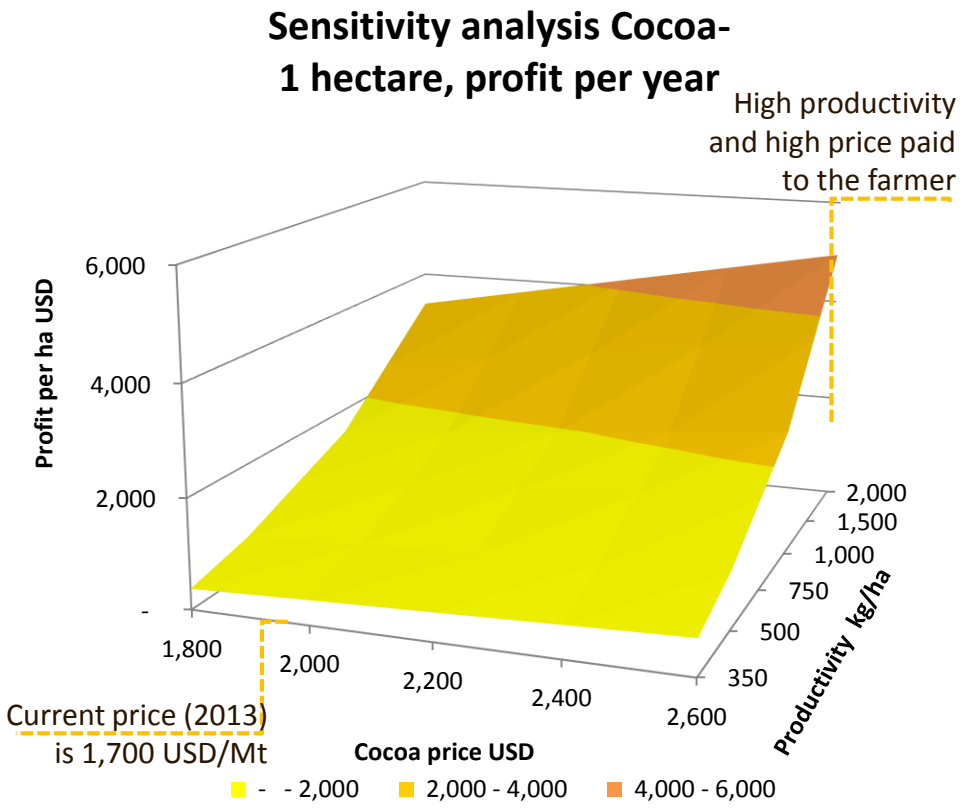
Sources for cocoa: market prices (ICCO April market report), farm-gate prices (Reuters), production costs (Pattiasina Suripatty, 2011)
*The minimum wage is given per region, the lowest is in Central Java and the highest is in Jakarta (wageindicator.org)

Cocoa can be profitable under the right conditions (high productivity and quality). When compared to competing crops , especially palm oil, the profitability is relatively low (see figure). The productivity and its return on investment (including labor) has to improve significantly in order to have a meaningful impact on the cocoa farmer income and thereby his interest in growing cocoa.

Historically, palm oil has had relatively higher prices, and average yields are high. Another advantage is that smallholders can easily grow more hectares of palm oil without loss of productivity, whereas for cocoa that the limiting farm size is mostly 2 ha. Rubber prices were also high in the past years, although they have dropped dramatically during the last year. The price paid for cocoa has been relatively *constant* when compared to the fluctuations in the FFB palm oil or rubber.

When comparing crop profits with minimum wages in Indonesia, one sees that the profit of growing 1 ha of cocoa can often not compete with the low annual minimum wage in Indonesia.

Cocoa has to be highly productive to remain competitive

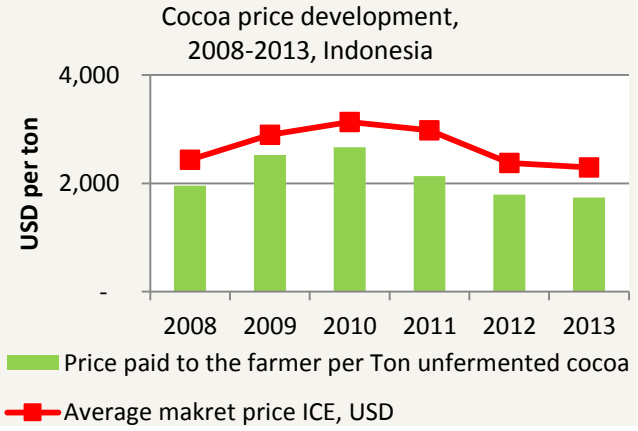


Looking into the development of the cocoa sector, there are two determinant factors in the profitability of cocoa farming:

- **Productivity of the farm**, Cocoa requires a high skill set to deliver financially viable yields. This also depends on inputs, farm management, plantation age and weather conditions.
- **Price paid for cocoa at farm gate**, that is linked to the international stock prices, but also depend on quality and region.

Solid profit margins are achieved when yields are higher than 700 kg/ha, but remain sensitive to price fluctuations.

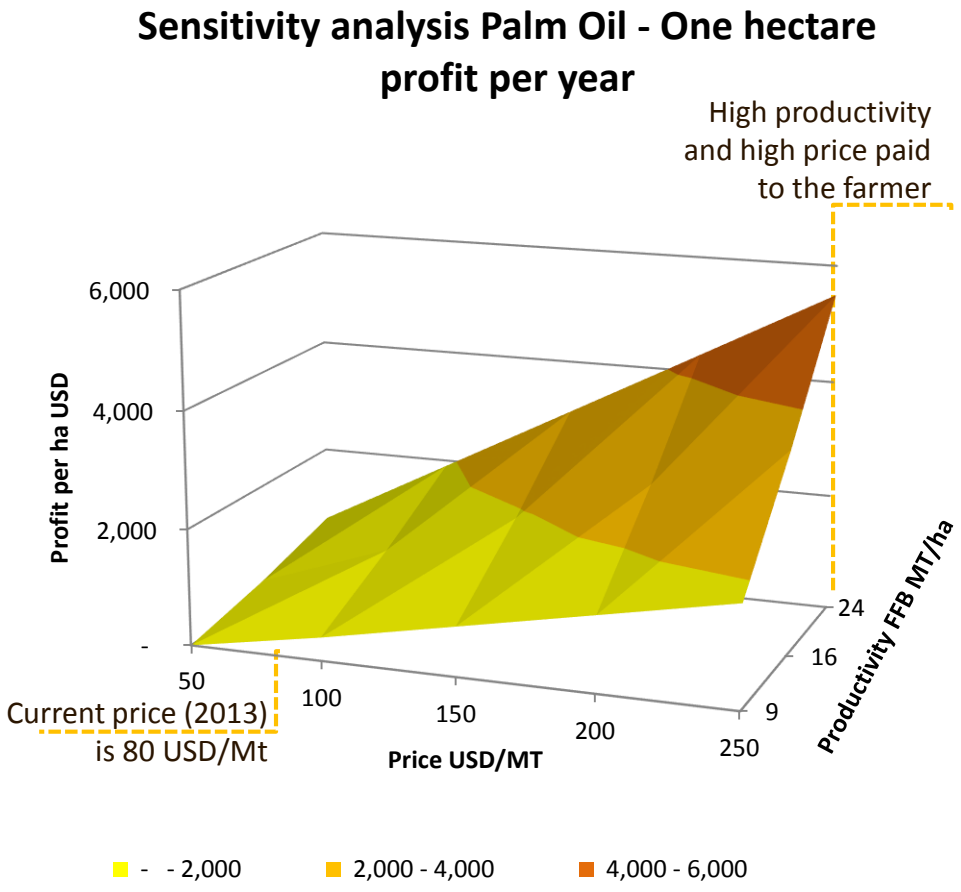
Current prices paid at farm-gate vary from 15,000 IDR to 25,000 IDR per kg



* Numbers for 2011-2013 are estimations

Sources: ICE prices, Disbun statistics, Pattiasina Suripatty (2011) and NewForesight analysis

Oil palm: competitively priced and less demanding



* Numbers for 2011-2013 are estimations

Sources: ICE prices; Disbun statistics; Budidarsono et al, 2012; AidEnvironment (2010); ERE Consulting, 2012; and NewForesight analysis

In the case of palm oil, it can be seen that higher profit margins are easier to get within the normal productivity range. Palm oil is more competitively priced.

Other factors are also relevant for the success in the adoption of palm oil, such as:

- Stronger support structures in palm oil adoption given to smallholders by large industry, such as assistance in oil palm planting and relatively low-interest loans and costs for inputs.
- Proper management of oil palm is less labor intensive than cocoa. Achieving higher yields is therefore less costly and requires a less elaborate skill set. This also makes it possible for smallholders to cultivate several hectares of palm oil with high productivity. Cocoa becomes hard to manage properly beyond 2 hectares.
- Oil palm is a hardier crop than cocoa and is less prone to irregular environmental conditions
- Cocoa farmers are influenced by the success stories they see and hear from their fellow farmers growing oil palm. This makes them decide to join the bandwagon (‘*ikut-ikutan*’)

The cocoa business case

Categorizing the cocoa farmers to measure impact and target effectively

Farmers not using inputs/GAPs

When farmers do not use any input such as fertilizer, planting material or pesticides and do not apply a minimum of GAPs, yields are generally very low (around 350 kg/ha). Furthermore, trees become highly sensitive to pests and diseases, affecting yields even further.

Farmers applying GAPs

Good Agricultural Practices (GAPs) involve several practices, among them:

- Proper farm nutrient management (e.g. understanding how to appropriately apply fertilizer)
- Pruning
- Frequent harvesting
- Sanitation

Farmers applying GAPs could have a yield increase of 40%.

Farmers using organic matter as fertilizer

Organic matter groups all the soil fertility techniques that do not require mineral fertilizer: cocoa husk, rotten rice, chicken manure, other husks, compost, etc. In order to be effective, the adequate dose is 5 kg per tree. It is estimated that farmers that use organic mater in combination with other inputs increase yields by approximately 20% when compared to the farmers not using it.

Farmers using fertilizer

Fertilizer impact on yields depends on several variables:

- Recommended dosage
- Right timing/application
- Proper management techniques such as pruning

Farmers that use fertilizer effectively could have yields from 800 to 2,000 kg/ha depending on the cocoa varieties.

Farmers using new planting material

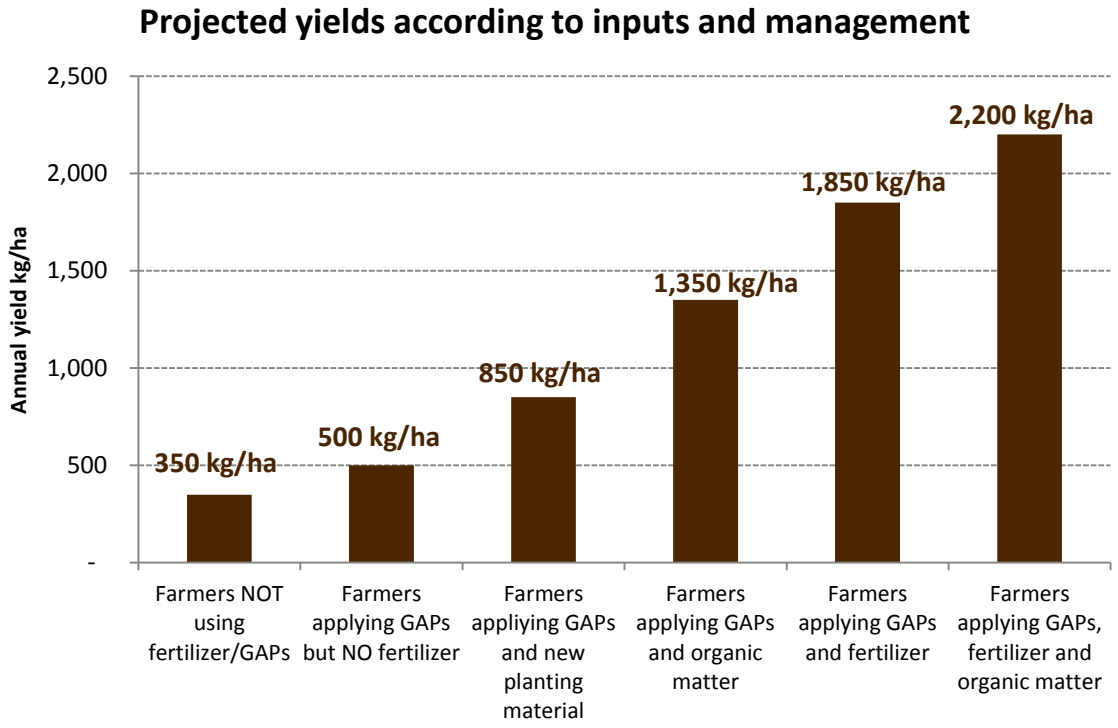
By replacing old, non-productive trees by new planting material of higher-yielding varieties, productivity could increase to 1,500-2,500 kg/ha in demo plots. This is only possible if other conditions are met:

- GAPs are applied
- Appropriate soil nutrient management (fertilizer)

Depending on the combination of the inputs and management practices, cocoa farmers could be categorized by yield potential.

The cocoa business case

Yield potential according to inputs and management



GAPs		✓	✓	✓	✓	✓
Fertilizer					✓	✓
Organic Matter				✓		✓
Planting Material			✓	✓	✓	✓

Source: IFC (2013) Final report of trial and demoplot in Polman, NewForesight analysis

It is estimated that an average farmer in Indonesia has a yield of 350 kg/ha without applying any kind of GAPs or inputs (assuming a planting density of 1000 trees/ha).

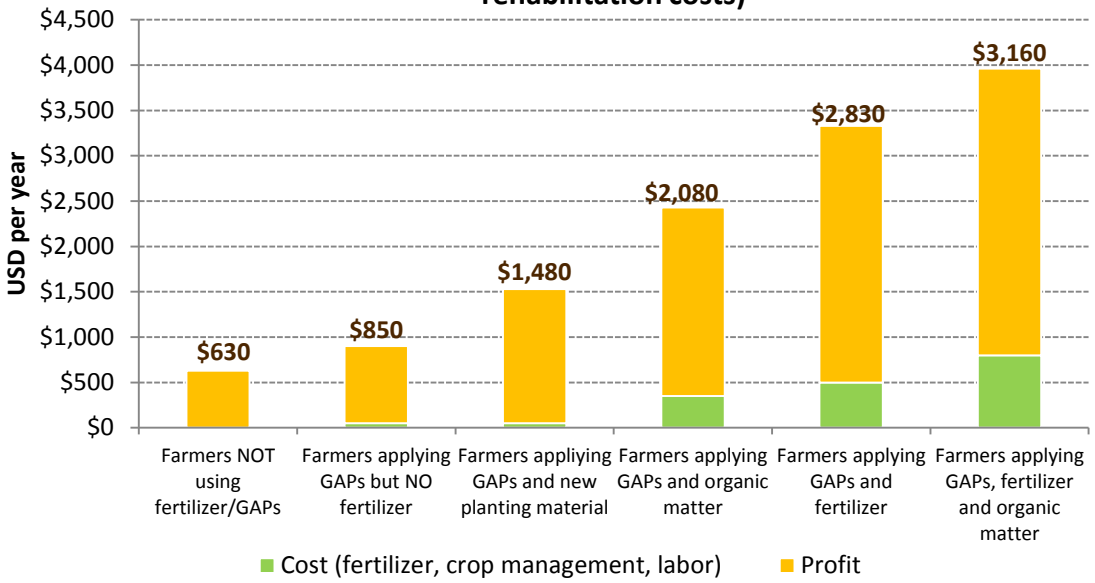
By adding fertilizer alone, without proper understanding of the right application methods and other GAPs (such as pest management), yield will not increase much. However, when fertilizer is used appropriately and in combination with other GAPs, yields could reach up to 850 kg/ha in the field.

Combining GAPs and proper fertilizer use (organic or mineral) with improved cocoa varieties, yields can increase dramatically to over 1,350 kg/ha.

When all practices are combined in the appropriate way, meaning GAPs + right quality of fertilizer + compost + improved planting material, yields could potentially increase to 2,200 kg/ha for the regions of Indonesia with optimal environmental conditions.

The cocoa business case

Farmer income could rise steeply with proper inputs and management



Productivity (kg/ha)	350	500	850	1,350	1,850	2,200
Crop mgmnt		✓	✓	✓	✓	✓
Fertilizer			≥480 kg/ha		≥480 kg/ha	≥480 kg/ha
Organic M				5 kg/tree		5 kg/tree
Additional Labor				1 worker		1 worker
Planting M				✓	✓	✓

Assumptions
Farm size: 1 ha, Fertilizer price: 450 USD/ha, Crop management: 50 USD/ha, Cocoa farm gate price: 1,800 USD/ton, Labor: 1,000 USD/year

Source: IFC (2013) Final report of trial and demoplot in Polman, NewForesight analysis
Perdew, Jessica Grace and Shively, Gerald E.(2009) 'The economics of pest and production management in small-holder cocoa: lessons from Sulawesi', Bulletin of Indonesian Economic Studies, 45: 3, 373 — 389

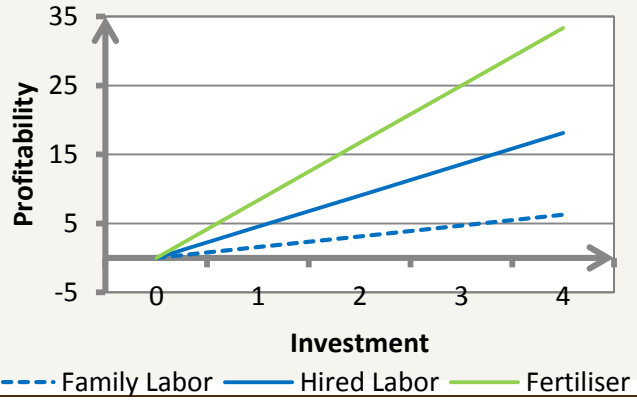
The chart on the left illustrates the profitability of a 1 ha farm under different conditions. In order to reflect the cost of using organic matter as fertilizer, 2-3 months of a full time worker (additional hired labor) was included in the costs.

The increase in yield will be reflected after one year of proper management. The impact of prior management will not affect yields, as long as the plantation is healthy.

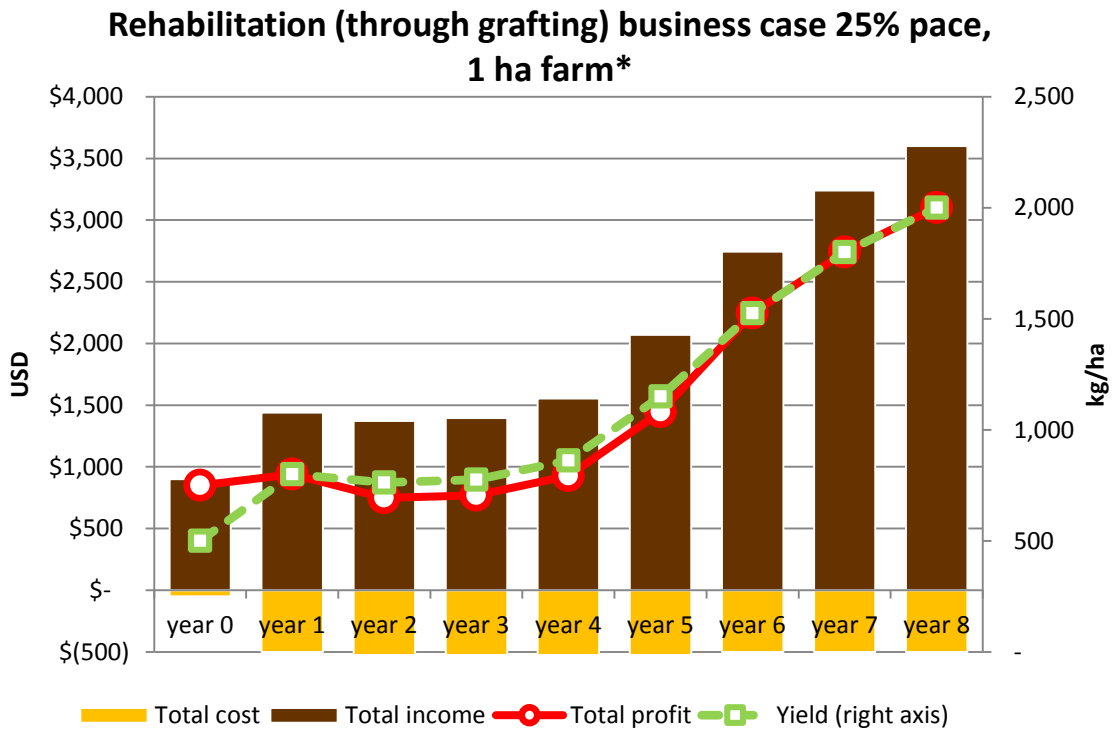
The graph below shows the result of a cocoa profitability study by Perdew and Shively on cocoa farms, where it was concluded that investing in appropriate use of fertilizer gives you the highest return on investment.

Relation investment-profitability

(Perdew and Shiveley, 2009)



The business case will have to be built over time



Training	GAPs training	GAPs applied	GAPs applied	GAPs applied	GAPs applied	GAPs applied	GAPs applied	GAPs applied	GAPs applied
Fertilizer use		100% fertilizer	100% fertilizer	100% fertilizer	100% fertilizer	100% fertilizer	100% fertilizer	100% fertilizer	100% fertilizer
Grafting			25% grafting	25% grafting	25% grafting	25% grafting	100%	100%	100%

Assumptions

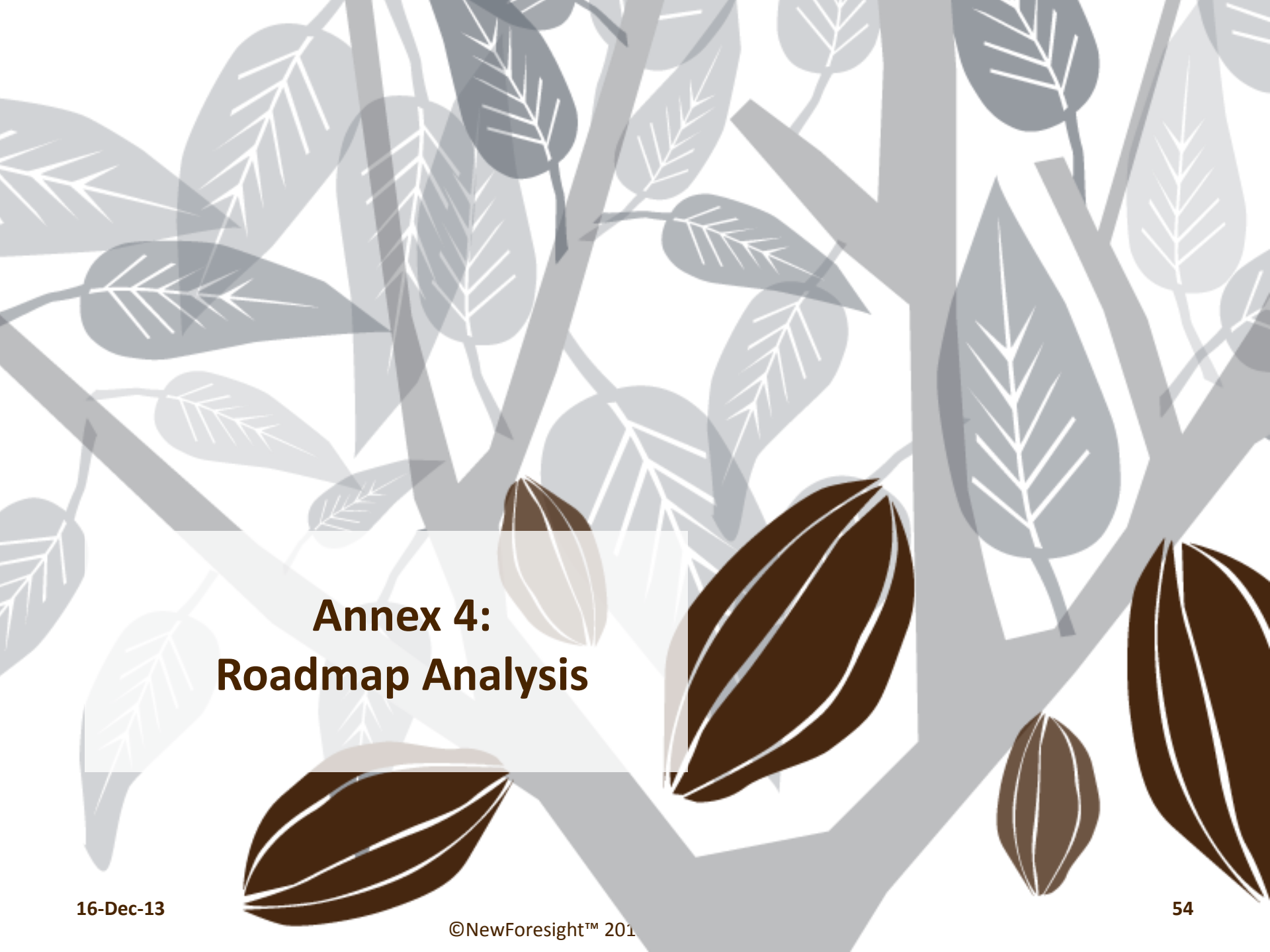
Farm size: 1 ha, Fertilizer: 450 USD/ha, Crop management: 50 USD/ha, Rehabilitation: 500 USD/ha , Cocoa farm gate price: 1,800 USD/ton

Source: MARS (2013) and NewForesight analysis.

In Indonesia, the availability of fertilizer can facilitate the rehabilitation business case.

Assuming that after one year of GAPs training fertilizer is available and effectively applied, increment in profit can help the farmer during the first years of rehabilitation.

It is proposed to proceed in a step-wise approach (at 25% pace) with the rehabilitation because of the amount of labor that is required, and the possible impact that it could have on the farm profitability.



Annex 4: Roadmap Analysis

Professional Farmer Package:

Agro-Inputs

The Professional Farmer Package

Background

Agro-inputs: farm nutrient management & pest control

The 'Agro-inputs' building block of the professional farmer package contains a set of productivity-enhancing agricultural inputs and practices, namely:

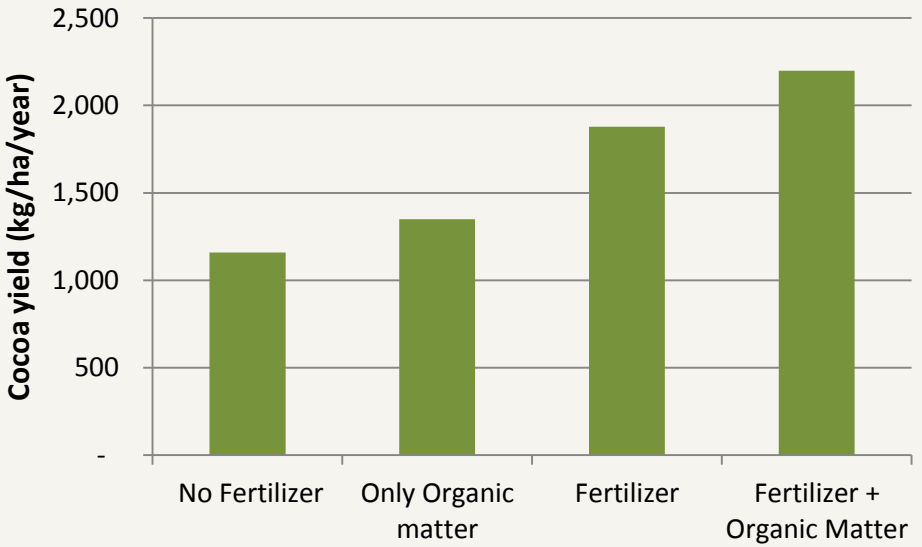
- Fertilizer: organic or inorganic material added to a soil to supply essential plant nutrients,
- Pesticides: chemical or biological agents to fight and control pests (e.g. insects, fungi, weeds),

This chapter will cover the various possibilities in farm nutrient management and pest control for Indonesian cocoa farmers. Herein, it will address some of the prominent current issues related to fertilizer and pesticides use by Indonesian cocoa farmers, e.g. appropriate application, quality and access. First, the chapter will discuss farm nutrient management, with a focus on the types of fertilizers used and their distribution system. Secondly, the chapter will cover pest control by explaining current pest control practices and best available methods.

Why farm nutrient management?

In order to increase the productivity of cocoa farmers, the appropriate use of fertilizers and pesticides is essential. The figure on the right demonstrates the substantial effect of appropriate fertilizer use applied to a base scenario of healthy planting material and combined with proper pruning. When combining inorganic fertilizer with compost, yields can more than double under the ideal conditions.

However, if fertilizer is not applied in the proper way or when a poor quality and composition of fertilizers is used, its yield-increasing effect will be severely limited.

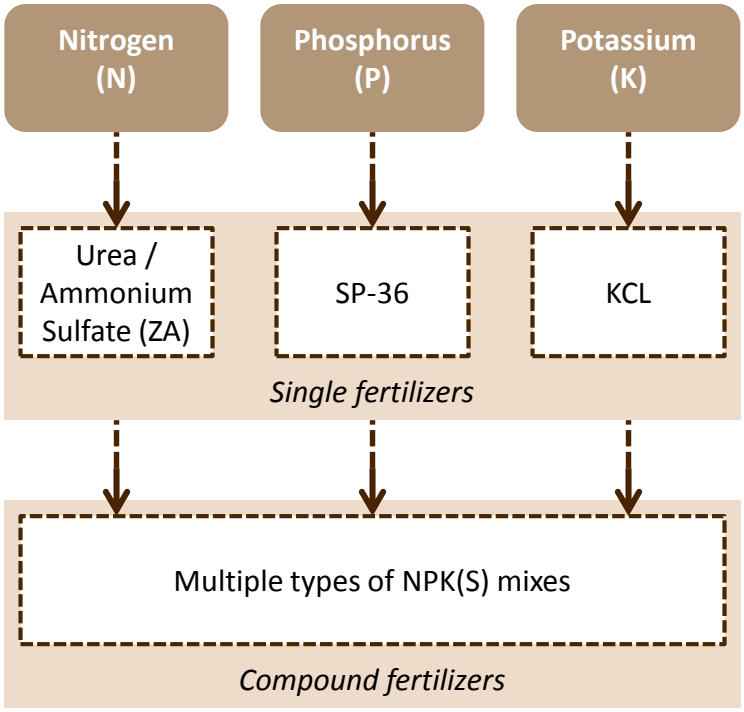


Source: Adapted after IFC (2013). *Final report of Trial & Demoplot in Polman*.

Farm nutrient management: Types of fertilizers available

Inorganic fertilizers

contain one or a mix of these primary macronutrients (sometimes enriches with others):



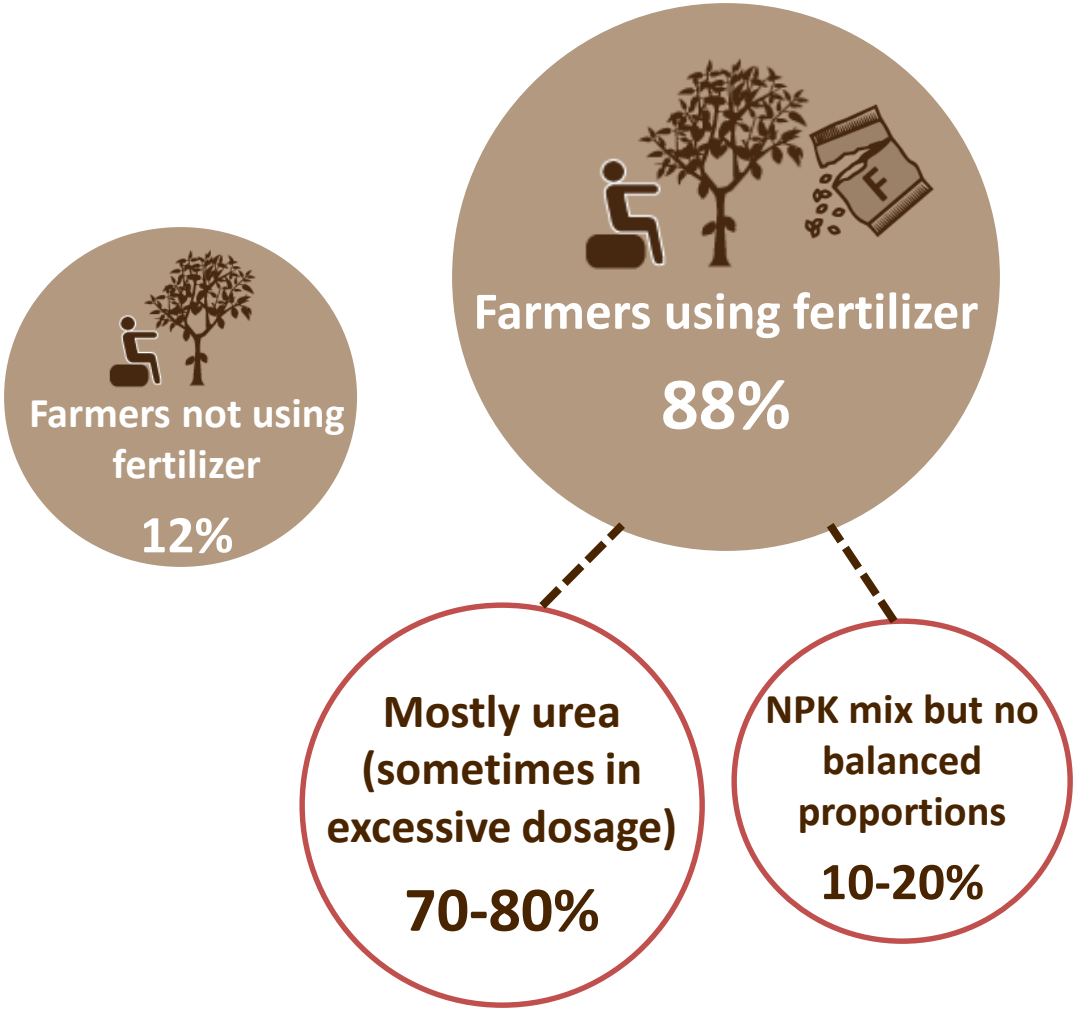
Organic fertilizer (compost)

Fertilizer created by composting organic waste material *(e.g. cocoa pod, pulp, rice husk, manures)*

- Inorganic fertilizers can be bought in a compound form or as single fertilizers.
- Soil needs a mix of nutrients and it is difficult for farmers to create the appropriate mix themselves out of single fertilizers.
- Compound fertilizers are more convenient and efficient, but also more costly.
- The production of organic fertilizers is done by the farmer himself from waste products, so material costs are minimal. However, it does require substantial labor and the necessary composting knowledge to produce the right quality of compost.

Background

The current farm nutrient management is far below best practice



Farmers do not use the right fertilizers

Fertilizer use is widespread under cocoa farmers in Indonesia. However, most of them apply only urea. Others use mixes of fertilizers but without the balanced proportions of elements that are necessary for cocoa trees.

Dosage and application are inappropriate

Farmers apply fertilizers in mixes, dosages and frequencies that are not appropriate. Their methods are not informed by guidelines or soil nutrient analysis.

Current incorrect use has negative side-effects

The ineffective way in which fertilizers are used currently has negative impacts on productivity and soil health. Excessive fertilization with nitrogen leads to soil acidification which is detrimental for cocoa productivity.

Farmers lack knowledge and financial resources or incentives

The current fertilizer use pattern shows that farmers have limited knowledge on effective farm nutrient management. They opt for inexpensive fertilizer options either due to lack of knowledge or financial resources.

Source: McKenzie et al. (forthcoming). "Farmer livelihoods and knowledge exchange in the cocoa sector in Sulawesi, Indonesia".

Background

Current farm nutrient management best practice guidelines are known

Timing & Frequency

Twice a year (when cocoa flowers)
- Beginning of raining season (Nov/Dec)
- End of raining season (Jun/Jul)

Frequency is higher for sandy soils (50-80% sand): 3-4 times/year

Type & Dosage

Sufficient and balanced mix of N, P, K, S, and micronutrients

Dosage is determined by bean harvest, soil nutrient content (based on soil analysis), and potential losses through leaching and erosion

Correct application

Fertilizer placed in circular band (60-80cm radius) around the stem

5-10 cm deep & covered with top soil directly

Additional

Manage soil organic matter by composting or integration with livestock

Liming if pH < 5.5.-6.5 (1 kg KAPTAN lime per tree)

Pruning to stimulate flowering & efficient nutrient usage for pods + shade tree management for reduced need of fertilizer

General guidelines (to enable yield of > 2 ton/ha, if combined with GAPs):
- ***Single fertilizer:*** 135g Urea (N) + 100g ZA (S & N) + 90g SP-36 (P) + 110g KCl (K) + 5kg compost per cocoa tree at beginning of raining season (repeat 1/3 of dosage at end of raining season)
- ***Compound (NPKS) fertilizer****:* 250-500g per tree (e.g. Yara, Tawon, NPK Pelangi, Phonska + extra Urea) and 5 kg compost for micronutrients and improved chemical/physical soil quality

Source: Sikstus Gusli (2012) - based on research in Polewali Mandar district, Sulawesi

Complicating factors for appropriate farm nutrient management:

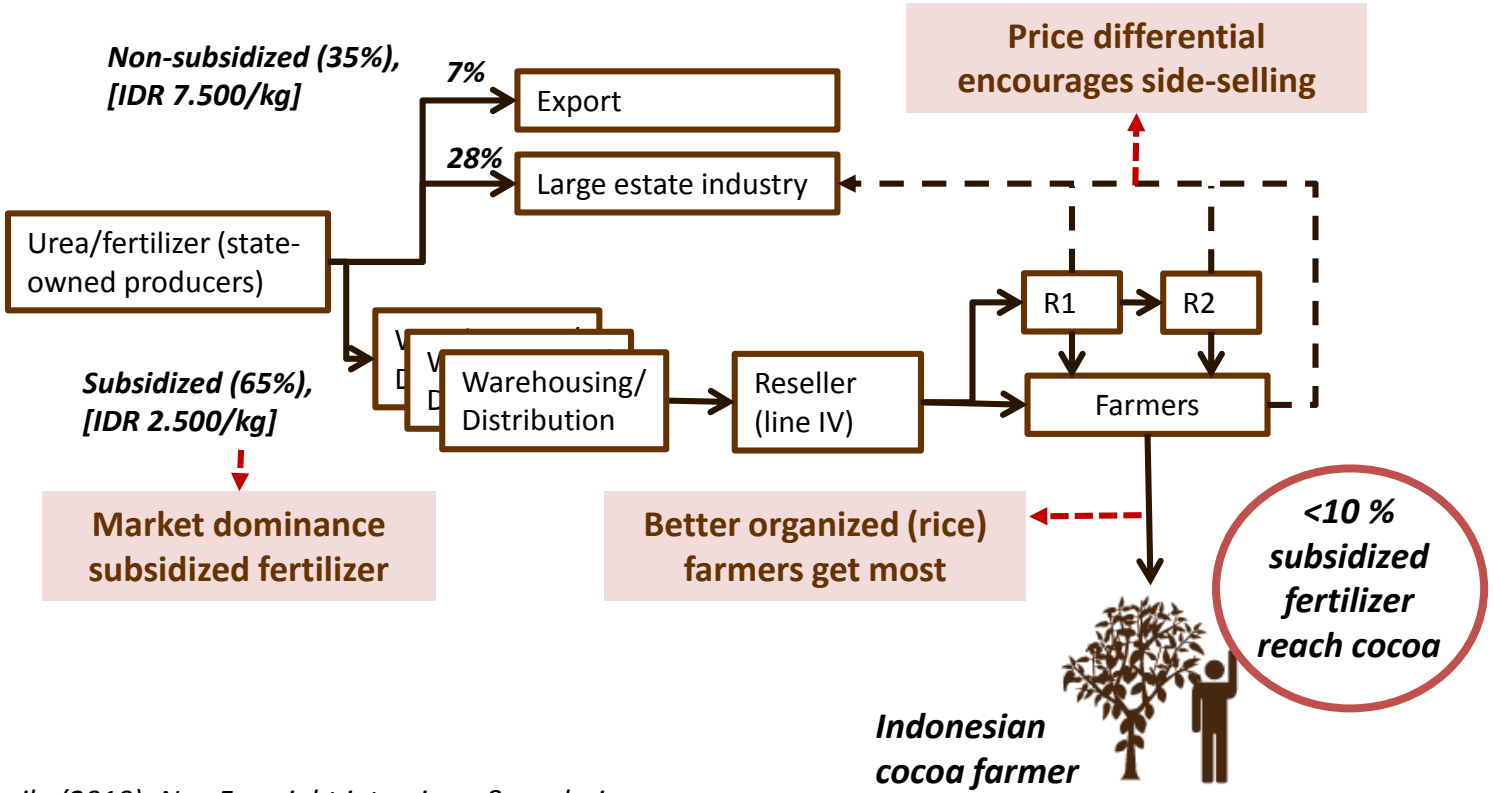
- There is no cocoa-specific fertilizer available that takes into account the specific needs of the crop.
- If farmers have access to compound fertilizers at all (which only a small minority does), the rice-specific fertilizers NPK 20-20-10 or NPK 15-15-15 are used. These contain much higher levels of nitrogen than cocoa trees require, and cause the soil to acidify.
- The majority of farmers use single fertilizers and often strongly rely on urea; a nitrogen-based fertilizer leading to acidification in the long-run.
- Many farmers lack the knowledge of proper fertilizer use

Background

Indonesia's subsidized fertilizer market and its inefficiencies

Indonesia has a large market of subsidized fertilizer, receiving 28% of national agriculture spending. A schematic overview of the subsidized market is shown below. The system knows several flaws that result in:

- Scarcity of (affordable) quality fertilizer at cocoa farm-level
- Farmers use the subsidized (mainly inorganic single) fertilizer incorrectly due to lack of knowledge. The added value to cocoa yield is therefore very limited



Source: Susila (2010); NewForesight interviews & analysis

Background

Fertilizer distribution reaches most cocoa farmers

Fertilizer market covers most of Indonesia

Fertilizer producer → Warehouse line → Reseller → Farmers

Over 80% of farmers use fertilizer

Indonesian cocoa farmer

Subsidized fertilizer:

The availability of subsidized fertilizer to Indonesian cocoa farmers is limited, with the majority of subsidized fertilizer going to the well-organized rice industry. Remaining issues here are:

1. Insufficient fertilizer quality for cocoa
2. Limited availability for cocoa farmers

Commercial fertilizer:

The distribution of commercial (non-subsidized) fertilizer covers most of Indonesia and is readily available to most cocoa farmers that can afford it. Nevertheless, the access of small villages to the fertilizer market could be improved. Remaining issues:

1. High prices limit access
2. Insufficient fertilizer quality for cocoa

Background

Pesticide use is widely adopted among cocoa farmers

Cocoa Pod Borer (CPB) is a common destructive pest that cocoa farmers in Indonesia have to deal with, causing up to 30% yield losses up till today. A common way to combat CPB is pesticide spraying. However, it should be applied in combination with frequent harvesting and proper pruning (PsPSP) in order to be effective. This does not always happen effectively.

The use of pesticides (insecticides, herbicides and fungicides) is a wide-spread practice among Indonesian cocoa farmers, and has been so for decades. A study by Hafid et al. (2012) found 96% of all Indonesian farms in their study to use some form of pesticide.

Bento, Supremo and Vigor are (relatively) commonly applied, possibly because these agrochemicals were distributed for free as part of the GERNAS program. Different studies, however, show different number for application numbers of specific pesticides.

There are substantial differences in the types and quantity of pesticides used by certified and non-certified farmers.

Natural pest predators (i.e. black and red ants) are another option to combat pests. These are not adopted widely, but do occur.

Product name	Pesticide type	Use (% of total farmers)
Bento	Insecticide	42
Alika 247 2C	Insecticide	18
Matador 25 E	Insecticide	12
Nurelle	Insecticide	12
Decis 2.5 EC	Insecticide	5
Supremo	Herbicide	43
Gramaxone 276 SL	Herbicide	36
AmistarTOP	Fungicide	6
Vigor	Pesticide Adjuvant	28

Pest control on cocoa farms is essential, but the current levels of pesticide use are excessive and destructive.

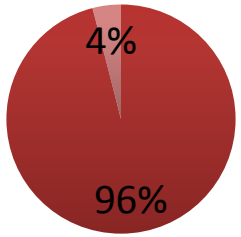
Sources: Hafid, Neilson, Mount & McKenzie (2012), McKenzie et al. (forthcoming)

Background

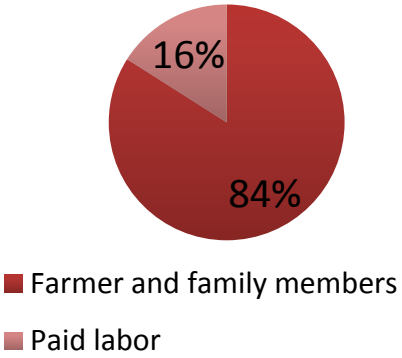
Cocoa farmers are aware of the risks of pesticide use

- Almost all farmers have concerns over the negative effects of pesticides.
- The need to restrict individuals from vulnerable groups from contact with chemicals through spraying is well-recognized, and most farmers realize the adverse health effects of pesticides.
- Farmers are show concern about the potential damage of farming practices (incl. pesticide use) to the environment.

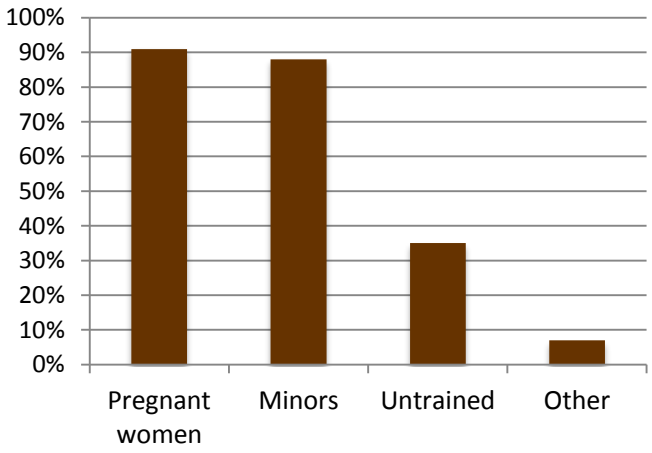
Farmers that use pesticides



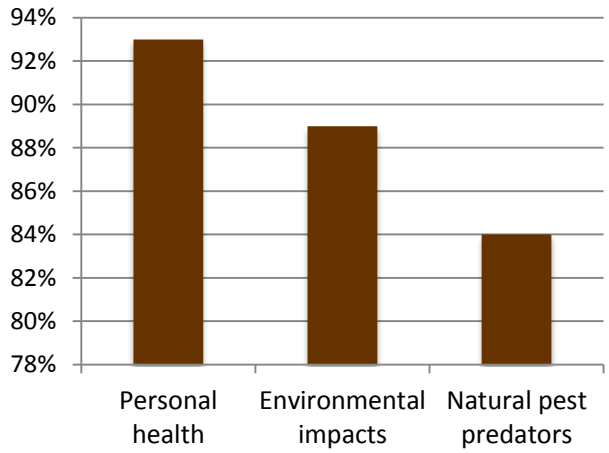
Application of pesticides done by:



Farmers concerns with spray restrictions



Concerns with negative effects



Source: Hafid, Neilson, Mount & McKenzie (2012)

Case studies
Agro-inputs

Progam name	Compost business model	Agronomy and Nutrition Research Program (CSI)	Sustainability Certification Program
Year	2005	2013	-
Partners	ACDI/VOCA	IPNI	Various private and public sector
Program description	Mars has promoted an on-farm composting business model which introduces an effective way to remove sources of pest and diseases and replenish soil fertility. Furthermore, it provides a cheaper alternative to chemical fertiliser and ways to integrate cocoa production with other landuses, including livestock. The two partners in this program facilitate farmer groups to establish compost businesses. An initial research identifies the availability of farm waste (cocoa pod, pulp, rice husk, manures) followed by determining the best composition of other substitute materials. This results in producing good quality compost. Farmers groups are provided with shredding machines. By 2008, there were 40 compost business stations in North-Luwu, Luwu and Kolaka district.*	This program aims to increase cocoa productivity by quantifying the effectiveness of balanced fertilizer application. This is done by creating a control and test areas and by building a compost house. Farmers are engaged in good fertlizing management through training and by using compost machine donated by Mars. Waste materials that goes into the compost are: waste cocoa pods, corn and banana stalks, rice husks, pruning from shade trees, cocoa bark waste. The project has identified 20 smallholders who are struggling to maintain productiviy levels under increasing pressure of pest and diseases with inadequate application of necessary farm inputs.*	Due to increased health concern of inappropriate application of pesticides, the use of protective clothing and equipment has become a requirement of certification bodies. The two known certification program for the Indonesian cocoa sector provide training in the use of pesticides. This includes most of the following pesticide requirements: storage, PPE, qualification of the sprayer, cleaning of materials that had direct contact with pesticides, re-entry time awareness*.
	* "Understanding Farmer Engagement in The Cocoa Sector in Sulawesi: A Rapid Assessment", 2012, Hafid & McKenzie	*http://www.cocoacare.org/blogs/supporters-page-ipni/8915749-compost-machinery-training	* "Panduan Sertifikasi Kakao Berkelanjutan", 2012, CSP (RA, UTZ, Mars, Veco, ICCRI, Swisscontact)

Professional Farmer Package:

Planting Material

The Professional Farmer Package

What are the available methods? A brief technical overview of planting material

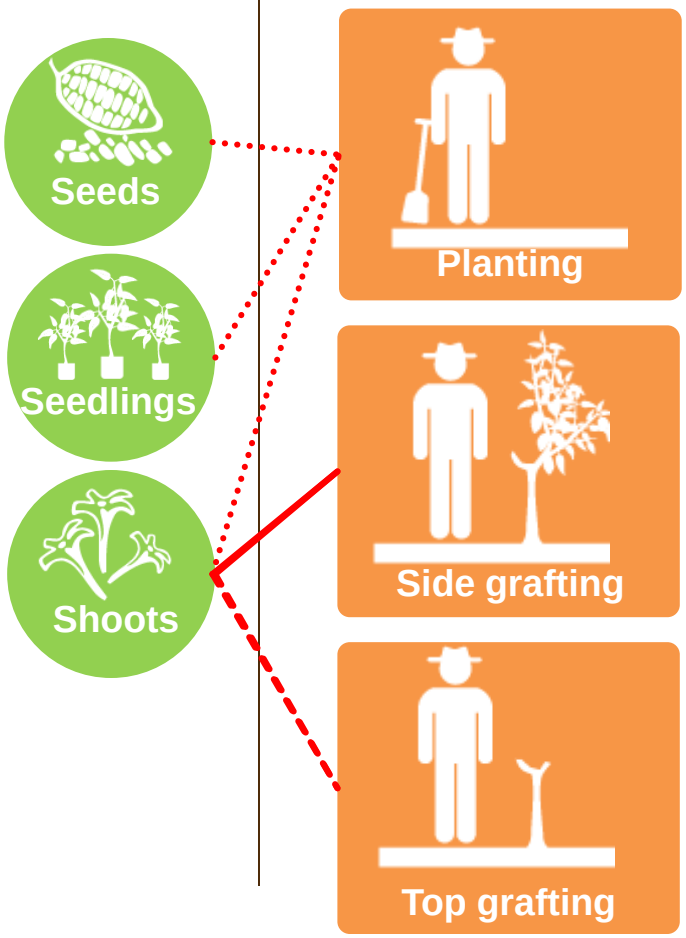
Propagation method

Sexual propagation

- Done by using (traditional or hybrid) seeds.
- Farmers can grown out the seeds themselves or buy them as seedling from a nursery.

Vegetative propagation

- **Somatic Embryogenesis**: Propagation of trees from embryos derived by tissue culture from selected parts of the mother plant. They can be
- **Grafting**: Implantation of shoots (scions) from the mother plant onto (the root system or stem of) another plant.



Planting/grafting method

Planting

- **Seedlings** can be planted directly in the soil. These can be grown out from seeds, SE plantlets or:
- **Rooted cuttings**: these are plants derived from shoots of the mother plants that are rooted. They can be orthotropic (upright stature) or plagiotropic (spreading).

Grafting:

- **Top grafting** is to graft onto the base/root system of another plant.
- **Side grafting** is to graft onto the side of the tree stem.

Background

Planting material structure in Indonesia

PLACE

- The geographical reach of the planting material (PM) infrastructure is excellent.
- If anything, what is missing is the capacity to demonstrate the potential of advanced PM

PROCESS

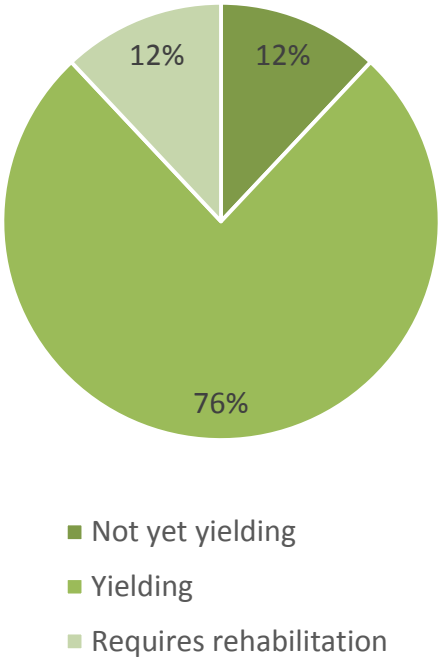
- The scale and efficiency of the structure for propagation and distribution in Indonesia is sufficient and efficient.
- Farmers have a relatively advanced knowledge of the practices related to grafting and are often able to do this themselves.

PRODUCT

- The genetic qualities of available PM is generally quite good.
- The best materials are not necessarily the ones distributed at scale.
- What is missing (at scale) is PM resistant to pests (like CPB).

The state of Indonesian cocoa farms: age and productivity of

Productivity of trees

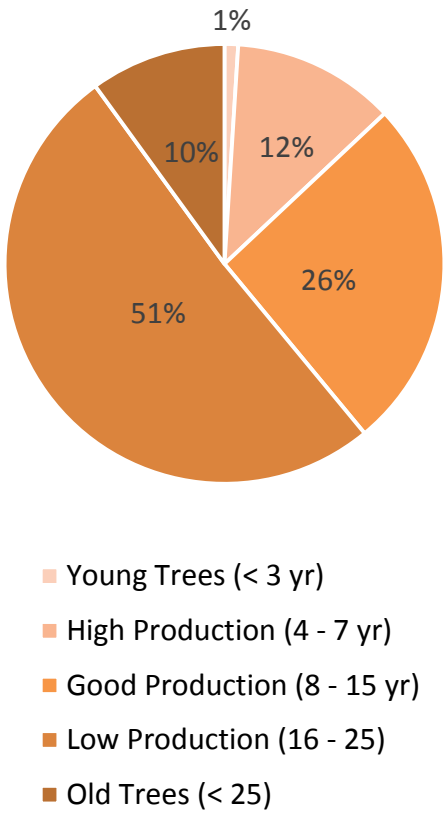


The need for rehabilitation remains urgent

- The average cocoa **tree age** in Indonesia is **17 years**
- **61%** of farms are in a **low production** phase

- 76% of trees are yielding trees
- 12% of trees are too young to be yielding
- 12% of trees require rehabilitation because they are old /unproductive

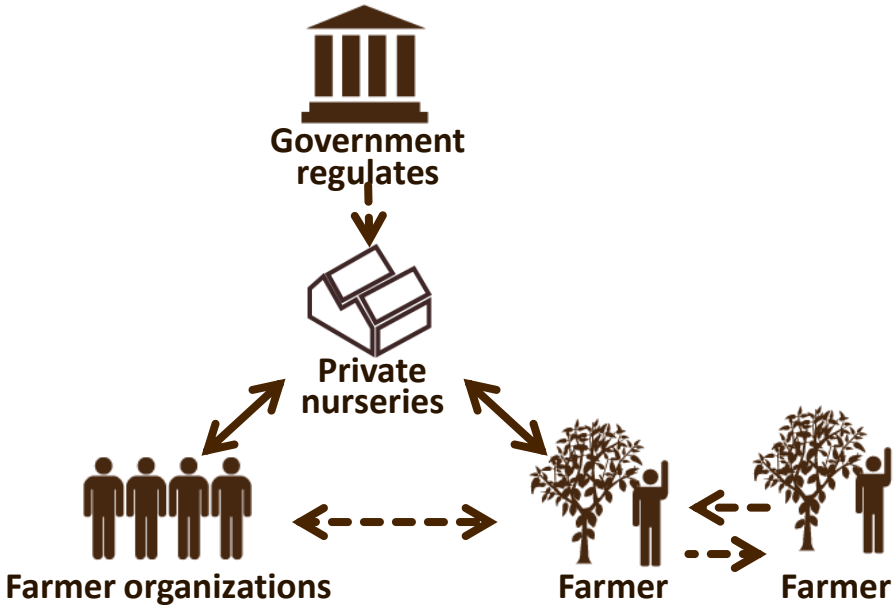
Age of Indonesian Cocoa Farms



Swiss Contact, *Preliminary Baseline Report for CSP Road Map* (2013)

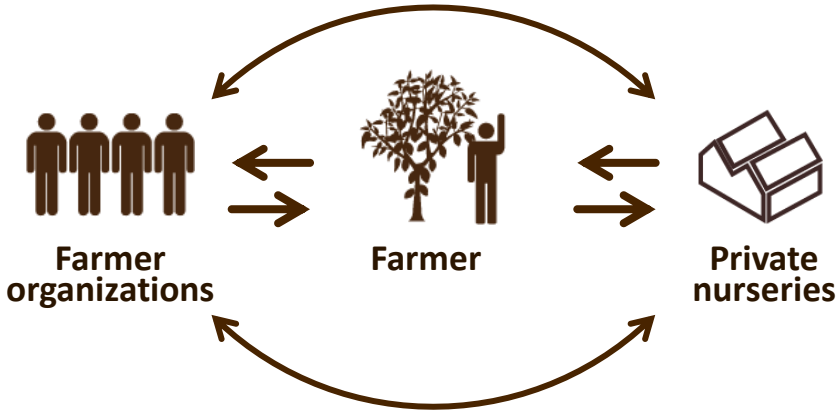
Broadly speaking there are two schools of thought on PM propagation and distribution among CSP stakeholders

Planting material distribution strongly regulated by the government



- This is the current (formal) system in Indonesia, whereby the government regulates quality across the system. A network of private nurseries is licensed to commercially distribute PM.
- Informally farmers (and organizations) still exchange PM (with and without cash compensation).
- According to a majority of stakeholders central control in terms of quality needs to be preserved and more effectively enforced, to efficiently spread highest performing PM.

"Free" planting material distribution model (lightly regulated)



- According to some stakeholders the most effective way to circulate high (er) quality PM is to stimulate (commercial) exchange of PM among farmers and organizations/nurseries, without enforcing the current licensing system.
- One could argue that this exchange happens a lot already.
- Farmers generally do not take into account the long term performance of genetic material.

Case study

Planting material

Progam name	PRIMA (Pest Reduction and Integrated Management)	GERNAS kakao
Year	2003	2009 – 2013 with extension to 2014
Partners	-	CSP (ACIAR, PPKKI/ICRI, Mars, ASKINDO), AIP, Nestle
Program description	The main transformation and increase in productivity lays in the use of higher-yielding varieties of cocoa. The researchers in this program also look for clonal trees of small stature due to the easiness to manage pests & diseases. By replacing old trees with short, high-yielding varieties or by grafting budwood from superior varieties onto old trees, farmers have been able to double or triple their yields. In practice it is difficult to rehabilitate cocoa gardens on exhausted soils, however by applying good agricultural practices this challenge can be overcome. This program has arranged institutional farm field trials where farmers learn about new production techniques through demonstrations at Mars Cocoa Development Centres, which in turn support a network of Village Cocoa Clinics. Owned and managed by local farmers, or cocoa doctors, the clinics provide improved planting material and grafting services to local farmers.	Gernas Kakao (national movement to accelerate the revitalization of cocoa) intends to improve the productivity and the quality of cocoa by promoting revitalization, rehabilitation and intensification of the cocoa. Revitalization consists of replacing old trees that are not productive with new planting in its totality or in steps. The used planting materials are *Somatic Embryogenesis* (SE). Rehabilitation includes the effort to improve the growth and productivity of a plant through side-grafting. A technical manual has been made to implement the above methods which includes practical criteria and requirements. After implementation, the program revealed the following problems: (1) reason of unsuccesfull side-grafting method is due to lack of coordination and planning between the farmer and the initiator. This is also an integral problem of insufficient farm organization; (2) (2) with regard to the use of SE, the study refers to a logistic problem which lead to a low quality of SE plant which results in a 'dwarf' size plant (instead of 30cm the farmer received 20cm) and in turn grows into smaller plants. The recommendation would be to have a local distributor of SE plants.

Professional Farmer Package:

Knowledge

The Professional Farmer Package

Farmer knowledge includes GAPs and business skills

The knowledge section of the Roadmap discusses the necessary skills and knowledge needed for the professional cocoa farmer. This includes:

- Good Agricultural Practices (GAPs) for sustainable cocoa farming (incl. proper use of agro-inputs and planting material);
- Business & management skills (incl. financial management)**.**

For the mentioned recommendations on agro-inputs and planting material to be successful, farmers need to have the knowledge and skills to manage these inputs. GAPs and business skills are essential to increase productivity, farm efficiency, and make farmers aware of the business implications of proper farm management practices

Pest management is widespread, but not always properly adopted

With a large share of annual cocoa yields lost due to pest and diseases (especially CPB), the most widespread GAPs among Indonesian cocoa farmers are integrated pest management practices. For this purpose, a great majority of stakeholders in the Indonesian cocoa sector promote **PsPSP**, the acronym for a GAP package consisting of frequent harvesting (*Panen sering);* Pruning (*Pemangkasan*); Sanitation (*Sanitasi*); Fertilization (*Pemupukan*) [see text box]

A majority of farmers (93%) claim to apply PsPSP, although what they do not do is strictly apply them based on the prescribed guidelines.

Other low-cost techniques that are promoted to fight pests & disease are:

- Bagging; *Rampasan* practice (harvest all pods once infestation is identified); use of ants; night smoking; painting oil on the pods (mainly to fight CPB)
- Spraying is more widely adopted to fight CPB, *Phythopthora sp., Zeuzera, Helopeltis,* and *Colletotrichum*

PsPSP as integrated pest management:

Frequent harvesting [Panen sering] - This method requires the removal of the pods from the garden while CPB larvae are still inside, thus preventing them from exiting and multiplying. It also reduces potential damage to beans. Farmers are encouraged to harvest a minimum of three times per month year round.

Pruning [Pemangkasan] - This is necessary for increasing production, as it creates a better-lit farm, which is not the preferred habitat for the adult CPB moth, and farmers are able to see and harvest all the pods. Unharvested pods are a major source of infestation.

Sanitation of pod husks [Sanitasi] - Sanitation destroys the larvae still living in the pod husks. Sanitation of pods is accomplished through burying them or covering them under plastic sheeting for a few days.

Fertilizer [Pemupukan] - The method emphasizes good soil fertility through composting and application of chemical fertilizer. This promotes healthier trees less prone to CPB infestation.

Source: McKenzie et al. (forthcoming). "Farmer livelihoods and knowledge exchange in the cocoa sector in Sulawesi, Indonesia".

Advanced GAPs

To get to real productivity gains more advanced GAPs are required, besides the partitioning of PsPSP. The advanced GAP set promoted by stakeholders in the Indonesian cocoa sector are:

- Nursery management
- Grafting techniques
- Understand pest & disease
- Replanting & rehabilitation
- Post-harvest product management
- Shade tree management

Few farmers are trained in the advanced package. This will greatly limit the potential impact of new planting material and the effect of fertilizer use, unless addressed.

Background

Farmers need additional business knowledge and skills

Another component of farmer knowledge that receives increasing attention is farmer business management. So far., this is only addressed by a limited amount of initiatives, mostly in the context of farmer organization. The business management in the Indonesian cocoa sector can be analyzed for two different targets: cooperatives and non-cooperative.

I. For cooperatives, business management is focusing on ***good governance, people management skills, operational management, financial and auditing techniques and development of business and marketing plans***

II. For non-cooperatives, business management aims ***to build awareness for a stable financial condition for each farmer's family and to motivate to join a farmer group organization to improve their economical condition***. Some of the topics that are covered in these programs are administration, bookkeeping and financial management skills.

With a good set of business management skills at hand, cocoa farmers can make informed decisions about their farm management. When they understand the business case of maximizing their productivity, they will be more inclined to invest in and apply agro-inputs, GAPs and labor dedicated to their cocoa crop.

Options

Several manuals exist for cocoa farmer training

Several stakeholders and sustainability initiatives in the Indonesian cocoa sector have developed manuals to train farmers in GAP (and to a lesser extent in business management skills). Examples of manuals developed by individual stakeholders are plentiful, as is their overlap. A recent example is the series a training guidelines developed by SwissContact as part of their Sustainable Cocoa Production Program:

Training Guideline Series *(developed under SCPP, 2013):*

- **Best Cocoa Cultivation Practices Manual** (directory for key farmers and field officers to deliver materials of best cocoa cultivation practices on: pests and diseases, cocoa natural enemies, PsPSP, top-grafting, side-grafting)
- **Post-Harvest, Cocoa Beans Quality and Fermentation** (guideline for program staff, government extension workers and key farmers on: post-harvest GAPs, cocoa beans fermentation, cocoa beans quality testing)
- **Cocoa Producer Group Empowerment and Certification** (directory for program staff, government extension workers and key farmers on Cocoa Producer Group strengthening and cocoa certification process through: strengthening the organizational capacities, improvement to financial management, certification of smallholder cocoa farmers product

A recent initiative for a sector-wide curriculum has led to the Sustainable Cocoa Certification Guidebook (CSP, RA, UTZ, Mars, SC, VECO, ICCRI, 2012). This guide intends to help farmers , farmer groups, companies and producer organizations to comply with the certification standards for farmers.

A sector-wide curriculum for cocoa farmer training indepedent of certification efforts does not exist to date.

Progam name	The PEKA Project (SwissContact)
Year	2010-ongoing
Partners	Armajaro, Mars, WCF
Program description	The PEKA (Peningkatan Ekonomi Kakao Aceh) project in Aceh, implemented by SwissContact, focuses on the rehabilitation of aged cocoa gardens, intensification of production, improving quality of production, better post-harvest processing, and access to financial services as well as markets. One of the project components is to improve cocoa-farming skill levels and increase participation in farmer organizations. At the start of the project, most of the more than 38,000 cocoa farmers in the selected five districts of Aceh had no access to information about best practices for managing cocoa and quality enhancement methodologies. After evaluation, adoption of on-farm recommended practices (GAP), disseminated through Farmer Field Schools, resulted to be strong, with almost all practices adopted by a majority of farmers. This has resulted in productivity gains of up to 115%. The GAPs taught in PEKA, as well as the model used for training farmers, is exemplary for many cocoa sustainability programs in Indonesia

Enabling environment

Modes of Delivery and Organization

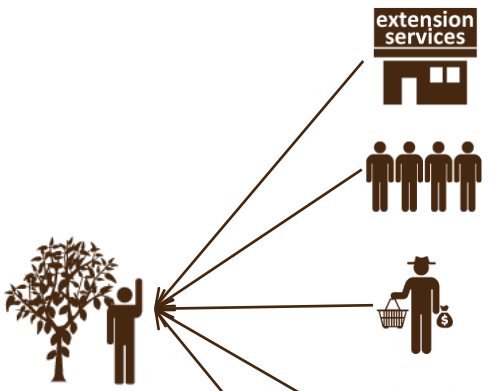
The Enabling Environment

Background

Exploring various modes of delivery and farmer organization

The chapter 'Modes of delivery and organization' examines how to enable and maximize the effective, large-scale adoption of best available agro-inputs, planting material and knowledge (i.e. the Professional Farmer Package) by cocoa farmers that is needed to achieve the roadmap's targets. The chapter will first look into the potential of different organizational networks within the Indonesian cocoa sector and their respective comparative advantages in reaching out to farmers. Secondly, options on how to increase the quality of delivery modes – and thereby effective adoption – are discussed.

Delivery and organization networks (outreach)



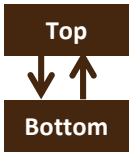
- Extension services network
- Farmer organizations (cooperatives)
- Local trader network (with a direct link to village collectors)
- Buying stations of large trading houses
- Supply partners (e.g. agro-input dealers, retailers)

X

(optimize combinations)

Modes of delivery (quality)

Trainer profile



Knowledge transfer

Communication methods

= Effective, large-scale adoption of Professional Farmer Package

Background

There is a range of existing networks for delivery and organization

Farmer organizations (coops)

Outreach: < 10%

Main products/services:

- Knowledge (GAPs & business skills)
- Agro-inputs (collective buying)

Local trader network (village collectors)

Outreach: >70%

Main products/services:

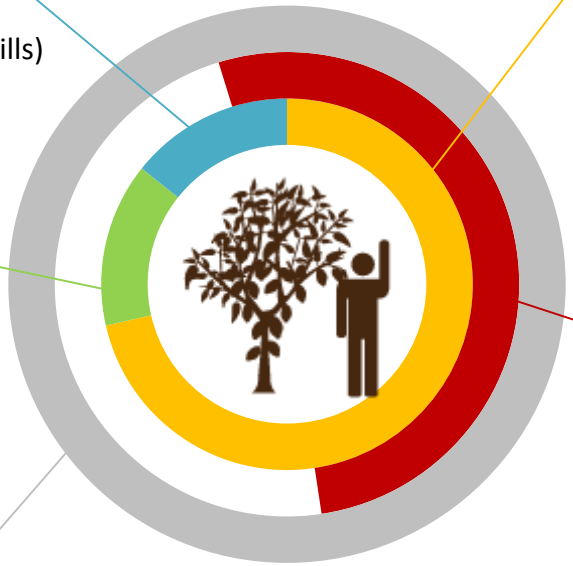
- Finance
- Agro-inputs

Buying stations large trade houses

Outreach: ~10% (number increasing)

Main products/services:

- Knowledge (mostly training on post-harvest processing and compliance to sustainability standards)
- Organization of farmers



Extension services network

Outreach: 50%

Main products/services:

- Knowledge (basic & advanced GAPs) through training and demonstration plots
- Planting material
- Agro-inputs (to lesser extent)

Supply partners

Outreach: high, but variable per product

Main products/services:

- Agro-inputs
- Planting material

The existent delivery and organization networks differ in their outreach (percentage of Indonesian cocoa farmers they are in contact with) and the type of product or service they typically supply to the farmer.

Options

Extension services networks and approaches

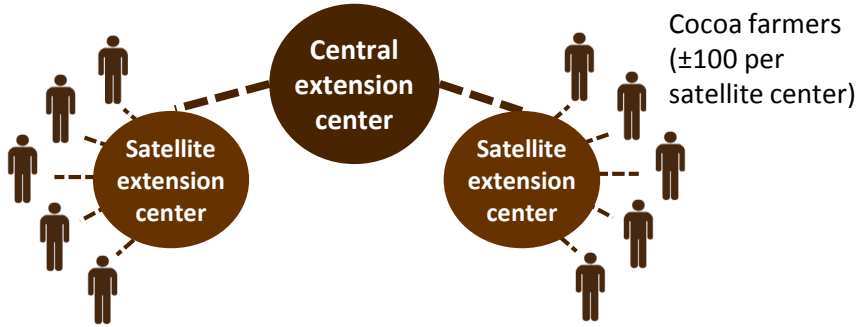


Figure XX. *Simplified schematic overview of general extension service network*

Table XX. *Overview of the main services and synonyms of central and satellite extension offices*

	Central extension centers (*hub*)	Satellite extension centers (*spokes*)
Also known as	District Cocoa Clinics (e.g. *SwissContact*) Crop Research Centre (e.g. *BPTP, GoI)* Cocoa Development Centre (e.g. *Mars*) Cocoa Centre of Excellence (*Barry Callebaut*)	Farmer Field Schools (e.g. *Nestlé, VECO, ACDI-VOCA*) District extension service agency (e.g. *GoI*) Cocoa Village Clinic (e.g. *Mars,* 51) Farmer Academy (*Barry Callebaut*)
Main services	Demonstration & training sites (e.g. clonal selection, GAP, business skills) Plant propagation & provision	
	Training the trainers Research & development (test clonal varieties, fertilizer & GAP)	Training the farmers On-farm trials Agro-input supply Grafting skills

Source: McKenzie, Palinrungi, Neilson, Muhammad, Fauziah (Forthcoming)

Context: The 'extension landscape' in Indonesia exists of both private and public sector intervention approaches. In general, extension approaches follow the same logic: they are built around a 'hub-and-spoke' model where information (or technology) is transferred from central extension centers through local extension centers to the individual cocoa farmers. The central and regional extension hubs commonly serve as demonstration and training sites and play a role in the provision of cocoa plantings. At a central level, the focus is on training the trainers and R&D. At a local level, information and inputs are transferred to the farmer.

Who's involved: A vast majority of actors is involved in extension interventions. They use different names for their centers.

Opportunity: Extension efforts have significant outreach in the Indonesian cocoa sector, especially in Sulawesi, where >50% of cocoa farmers have participated in formal training programs at least once.

Challenge: Although total outreach is high, the adoption rate of knowledge and effective application of inputs is lagging behind due to limited trainer capacity, quality and continuity as well as insufficient adaption to individual farmer reality.

Options

Farmer cooperatives, local trader network, buying stations & supply partners

Besides the extension services networks, a cocoa farmer has other value chain connections that currently deliver a diverse set of productivity related products and services. Their characteristics and potential are described below.

Farmer cooperatives

- **Context:** Indonesian cocoa farmers are traditionally organized in village-level groups of ±25 farmers, to access extension services and cooperate on labor-intensive activities like pruning and pod sanitation. Formal farmer organization in cooperatives is very low (<10% of cocoa farmers).
- **Who's involved:** There is increasing interest from many stakeholders in organizing farmers to improve collective marketing, agro-input buying, post-harvest handling, business skills, certification, etc.
- **Challenge:** So far, achievements in organizing farmers into formal cooperatives have been limited.

Local trader network

- **Context:** There is a strong informal local trader network in the Indonesian cocoa sector. Up to 90% of farmers sell their cocoa directly to local collectors at the farm-gate or local traders at warehouses. Local middlemen are a source of pre-harvest finance to 20-50% of cocoa farmers, either in cash or in-kind (agro-inputs).
- **Who's involved:** Several initiatives exist that recognize and leverage the local trader network for extension interventions to cocoa farmers (e.g. SUCCESS Alliance, PEKA, Mars & VECO).
- **Challenge:** Generally programs bypass local trader networks by establishing cooperatives and up-stream buying stations in order to create shorter, more effective and transparent value chains.
- **Opportunity:** Options to include the local collector and trader network in extension activities are:
  - Equip collectors to give basic training to farmers.
  - Increase access to finance for farmers through local traders and collectors.
  - Support local traders to improve post-harvest processing through credit and training.

Sources: Wolf, de (2013) Lessons Learned and Opportunities for Scaling-up of Successful Models of Value Chain Development for Smallholder Cocoa, Coffee and Tea; MicroSave & e-MITRA (2013). Market Insights into the Financial Behaviors and Design of Mobile Financial Services Products for Cocoa Farmers in Indonesia; Hafid, Neilson, Mount & McKenzie (2013). Sustainability Impact Assessment of a Certification Scheme in the Indonesian Cocoa Industry: 2012 Pilot Survey

Options

Farmer cooperatives, local trader networks, buying stations & supply partners

Buying station

- **Context:** Larger international firms establish local or 'up-stream' buying stations to source cocoa locally and directly from the farmer. The direct sales of farmers to buying stations mostly done by certified farmers (86% of sustainable certified farmers sell directly to buying stations).
- **Who's involved:** The increasing number of up-stream buying stations is a trend that is promoted by many stakeholders and intervention programs in order to create shorter, more transparent and sustainable supply chains.
- **Opportunity:** Several buying stations are already involved in training on quality improvement and towards compliance with sustainable certification standards and farmer organization. To a lesser extent, buying stations are involved in schemes facilitating access to agro-inputs and credit to farmers. Some trading houses also apply SMS price information systems for market transparency.
- **Challenge:** Maintaining loyal relationships with individual farmers often proves difficult due to high competition among traders for cocoa, favoring side-selling of cocoa by farmers.

Agro-input suppliers

- **Context:** Agro-input dealers, retailers and local counters (KUD) supply farmers with inputs. The suppliers' network supplies products throughout Indonesia. Commercial fertilizers and pesticides are widely available, planting material and subsidized agro-inputs to a lesser extend.
- **Opportunity:** Agro-input suppliers can provide credit schemes to facilitate farmers' purchases of agro-inputs. Some suppliers also offer training in the agro-input use. This trend is relatively new and is slowly picking up, e.g. in IFC's Agri-Finance Project and an upcoming AUSAID fund.
- **Challenge:** Conflicts of interest might occur. Moreover, no agro-input supplier is a CSP member.

Source: Hafid, Neilson, Mount & McKenzie (2013). Sustainability Impact Assessment of a Certification Scheme in the Indonesian Cocoa Industry: 2012 Pilot Survey Results

Options

Maximizing effect by supporting the right trainers and farmers

- To reach an optimal effect with scarce extension resources, it is crucial to prioritize the most promising trainers that can deliver quality training to farmers. By enabling these trainers to start their own extension or agro-input business, intervention programs would ensure a continuous and sustained delivery of knowledge and inputs to the adjacent farmer community even after the program stops.
- Experiences from private programs in selecting and supporting cocoa trainers are summarized below:

Trainer profile

- Trainers are mostly key cocoa farmer with a **high entrepreneurial drive**, that are selected based on their own merit and their willingness to train other farmers and adopt a range of good practices (GAPs, fertilizer and quality planting material). Collectors and traders can also fulfil this role, although it happens to a lesser extent.
- **Cocoa trainers are supported and stimulated to set up a self-sustaining business**, e.g. through the propagation and selling of planting material to local farmers and providing grafting skills. However, in the long-run, it often remains a challenge to generate enough revenues from training services and seedling production as farmers master skills quickly. Becoming a distributor of agro-inputs or develop on-farm composting are promising additional and reliable revenue sources for trainers that could further help the development of a reliant mode of delivery.

- In addition, there is the option to prioritize interventions in certain cocoa growing regions based on the farmer profile and region's climatic characteristics in order to achieve maximum effectiveness

Farmer profile

- The uptake of better agricultural practices and the use of agro-inputs tends to be higher for those cocoa farmers that rely on cocoa as their main source of income. For farmers growing cocoa as a secondary crop, adoption rates are generally lower. Clear rewards for improving bean quality also enhances adoption rates.
- The effect of training and improved input use is also influenced by regional climatic conditions. Highest effects are measured in areas with optimal growing conditions for cocoa (e.g. plentiful rain, especially during 'flushing period')

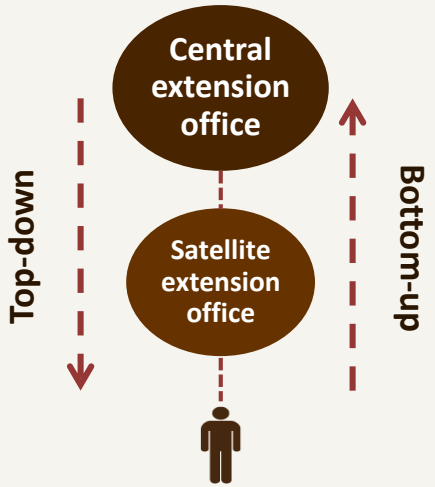
Options

Knowledge transfer can be approached in a variety of ways

There are different conceptual approaches for knowledge exchange in farmer extension services:

- The **top-down approach** ('technology transfer paradigm'), the dominant model since the 1960s where the content of the training programs is designed based on the priorities identified by a central body/institution. Scientific research is seen as the main driver of innovation, with limited input from farmers.
- The **bottom-up approach** ('participatory paradigm') involves communication from the farmer back to the trainer and researcher (two-way knowledge flows). This approach promotes extension agents to become facilitators of knowledge exchange and interaction among stakeholders (farmer, trainer, researcher etc.)

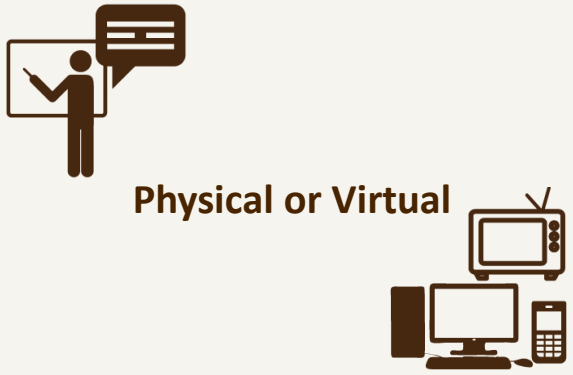
The bottom-up approach receives increasing attention and should be given consideration by CSP members.



For communication methods, also two distinct approaches exist:

- **Physical knowledge transfer** happens through direct training and visual or diagrammatic representations and manuals. This traditional way is effective to interact with the farmer and ensure that the training is properly assimilated. Costs are high.
- **Virtual knowledge transfer** in Indonesia takes place largely through the use of mobile phones (or video), internet is not readily available yet. Advantages are the low cost, real time and keeping track of the current farmer situation

Physical and virtual knowledge exchange are not exclusive to one another. The strengths of both methods can be combined to achieve to optimize the effectiveness of intervention programs.



Source: Hafid & McKenzie (2012) Understanding Farmer Engagement in the Cocoa Sector in Sulawesi

Case studies

Modes of delivery and organization

Progam name	Cocoa Chain Development Program(VECO)	Cocoa Development Centers/ Cocoa Village Centers (Mars)
Year	2010 - 2013	2005 - present
	Armajaro, AMANAH, Wasiat	Various partners
Program description	The Cocoa Chain Development Program of VECO aims to improve productivity and quality by organizing farmers and creating market linkages between smallholder cocoa farmer groups in West Sulawesi and companies like Armajaro and Mars. Through weekly trainings and practical research on farmers' plots, existing village farmer groups were turned into business units. Besides these farmer school activities, the program also experimented with collective input procurement and produce selling. By structuring the farmers into groups of about 25, several larger cooperatives of around 150 farmers have been created*. Eventually, by mid-2011, 67 farmer groups qualified for UTZ certification of the unfermented cocoa beans they produce after a rigorous 10-month process. *VECO (2011) Increased incomes for Indonesian cocoa farmers in sustainable markets: NGO-private sector cooperation on Sulawesi island. Full case study.	Mars' program for a more productive and sustaianble cocoa sector is built around a 'hub and spoke' model. Within this program Cocoa Development Centers (CDC) and Cocoa Village Centers (CVCs) play a pivotal role. CDCs ad CVCs are demonstration and training sites, were farmers are trained in nursery management, grafting techniques (top and side), understanding pest and disease, amongst others. Each side is funded and developed by Mars, but has been established with additional support from an alliance of companies and organizations. CVCs are expected to work directly with around 100 individual farmers and each clinic is run by a Cocoa Doctor, usually a local farmer trained by Mars. The CVCs are established as self-sustaining businesses, for long term sustainability. Currently there are 51 CVCs across Indonesia.* Mars' model is appreciated by government extension services and has been widely adopted by NGOs**. * Hafid, Neilson, Mount & McKenzie (2013). *Sustainability Impact Assessment of a Certification Scheme in the Indonesian Cocoa Industry: 2012 Pilot Survey Results.* ** World Agroforestry Centre (2011) Cocoa Futures: An innovative programme of research and training is transforming the lives of cocoa growers in Indonesia and beyond

Enabling environment:

Access to Finance

Background

Access to finance allows cocoa farmers to invest in their business

To be able to achieve the necessary productivity gains formulated in the CSP roadmap, Indonesian cocoa farmers need access to financial resources to **purchase the components of the Professional Farmer Package** (agro-inputs, planting material) and make other long-term investments related to their cocoa farm.

The average annual costs related to cocoa farming are listed in the box on the right. On average, a **cocoa farmer needs $640 per year for cocoa production**, assuming optimal techniques and inputs are used. Those costs are concentrated in two periods of the year, prior to the two cropping seasons.

However, the majority of cocoa farmers have little space in their budget to afford the investments in agro-inputs for optimal production. **Savings are limited**, with more than 50% of cocoa farmers not having any kind of savings at all. One of the reasons is the low amount of cash inflows due to the high number of annual cocoa sale transactions of a very limited size (< IDR 500,000 each).[1]

Therefore, access to credit is a crucial component that needs to be addressed in interventions aiming to boost cocoa farmer productivity.

Average annual cost estimations related to cocoa farming on 1 ha

Input	Annual amount/ha	Annual costs
Fertilizer	500 kg	$400
Pesticides	5 liters	$100
Planting material	Highly irregular	$50
Family labor	55 person days	-
Hired labor	23 person days	$90
Total		$640

Note that in a context where smallholders commonly do not keep records of agro-chemical purchases, labor allocation, etc. (as this is often based on informal arrangements based on trust and duty), the information on production costs is difficult to estimate.

Background

Indonesian cocoa farmers' lending behavior

Only one-third of cocoa farmers borrows money. Of those farmers who borrow, almost half (48%) use the loan for agro-inputs and 11% for cocoa rehabilitation.

For those farmers able to obtain loans, the major credit sources are:

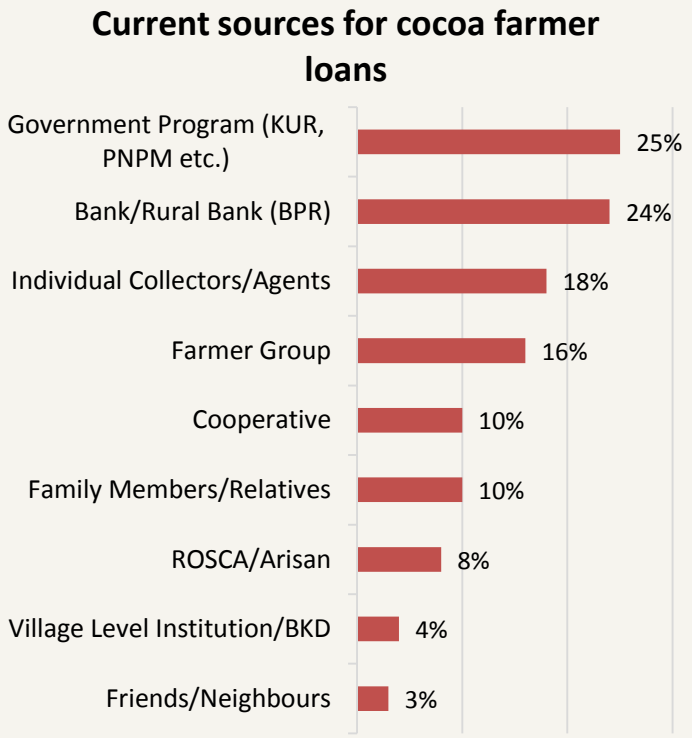
- Bank loans subsidized by GoI programs (mainly through Bank Rakyat Indonesia)
- Commercial banks and local rural banks
- Value chain finance through village collectors

Lead firms to whom farmers sell their cocoa rarely to never provide loans.

The main reasons why cocoa farmers do not or cannot obtain loans via formal channels (banks, either subsidized or not) are:

- High interest rates
- Lack of collateral
- Terms and conditions (e.g. repayment schemes)

The main issues with regard to access to finance are 1) how to enable access to finance for the two-third of cocoa farmers that currently cannot borrow, and 2) how to ensure proper allocation of loans to cocoa farming activities



Source: MicroSave & e-MITRA (2013). *Market Insights into the Financial Behaviors and Design of Mobile Financial Services Products for Cocoa Farmers in Indonesia*

Background

Supply chain pre-financing & complementary technical assistance

Note: the suggested options for access to finance regarding the farmer side (i.e. stronger farmer organization & financial literacy) are issues that are addressed in the chapters 'Modes of Delivery and Organization' and 'Knowledge'. In this chapter, the focus will be on options related to the role of industry (private sector value chain actors and banks)

Supply chain pre-financing

- **Context:** Local collectors and traders are currently the dominant source of value chain pre-finance for Indonesian cocoa farmers. Collectors provide a loan in cash or in-kind (agro-inputs) and deduct the loan instalments from cocoa payments to the farmer. Agro-input dealers could also pre-finance farmers.
- **Opportunity:** Pre-financing farmers' agro-input purchases could help suppliers to expand their business.
- **Challenge:** Agro-input suppliers must have sufficient financial capacity to provide pre-finance. Moreover, risk management must be in place (e.g. complementary technical assistance). Conflict of interest might arise.
- **Who's involved:** Currently the IFC is running a pilot of this approach with a Javanese fertilizer company.

Complementary technical assistance

- **Context:** All options of value chain pre-finance, whether granted by suppliers, collectors or large industry buyers, need to minimize the risk of farmers being unable to repay the loans.
- **Opportunity:** Cocoa income provides the best available alternative to collateral. Income could be stimulated through technical assistance to ensure maximum return in cocoa and thereby repayment. Moreover, the contact moments in trainings are a good occasion to remind the farmer of loan repayments.
- **Challenge:** Agro-input suppliers need to invest in sufficient training capacity, possibly with financial support.
- **Who's involved:** Most stakeholders have experience in providing extension assistance and are able to provide the necessary assistance coupled to loan provision.

Background

Reducing transaction costs & building the business case for banks

Lower transaction costs

- **Context:** Banks have little interest in cocoa smallholders due to high transaction costs. These transaction costs arise, amongst others, from the high costs of visits to the small and remote farms.
- **Opportunity:** Mobile technology can lower transaction costs by significantly reducing the number of field visits.
- **Challenge:** Not all farmers possess a mobile phone. Around 70% of cocoa farmers in Sulawesi own a mobile phone and 90% of those know how to send and read text messages, which would be a prerequisite for mobile financial services.

Business case for banks

- **Context:** Cocoa smallholders are unattractive to commercial banks due to low loan sizes, high transaction costs, lack of collateral, etc. Banks also do not understand the tree crop value chains and are unable to adjust to the farmer reality. Banks need a clear business case for banks to finance cocoa smallholders.
- **Who's involved:** Several programs, among which the IDH Growth Fund and IFC Agri-Finance project, support local financial institutions in the establishment of finance products and expanding microfinance activities.
- **Opportunity:** With a clear business model the programs hold an enormous potential for scalability.
- **Challenge:** Banks remain risk averse and the business case is still in development. Private and public partners could support the development of these models through loan guaranties.

Source: MicroSave & e-MITRA (2013). *Market Insights into the Financial Behaviors and Design of Mobile Financial Services Products for Cocoa Farmers in Indonesia*

Case studies

Access to Finance

Progam name	Armajaro value chain pre-financing	Indonesia Agri-Finance
Year	2006	2012 – 2014 (IFC)
Partners	Amanah	Armajaro, BTPN, AMARTA II
Program description	Armajaro has been involved in several sustainability programs in the Indonesian cocoa sector by providing value chain pre-financing. An example from 2006 is the support given to farmer groups in West Sulawesi by providing pre-financing amounting to 70% of the value of their projected sales. However, this was later stopped because the farmers also sell their cocoa to local traders when they receive better prices or have borrowed money from them (local traders can offer individual farmers credit in emergency situations and claim a long-term commitment in return). This loyalty issue is commonly known bottleneck for other value chain pre-financing initiatives in the Indonesian cocoa sector. The model therefore changed and Armajaro no longer offers pre-financing to individual farmers, but offers guarantees to enable farmer groups to access bank credit.	The Indonesia agri-finance project aims to develop commercially feasible, replicable smallholder credit models. The loan product includes a fertilizer and a cash component, and is tailored to the cocoa production cycle. Currently, the program works with a local fertilizer company and a bank. Farmers organize themselves in credit groups in which one farmer has to provide collateral. Loans are disbursed by the bank (up to $700), while the fertilizer provides the fertilizer in combination with technical assistance given through field visits. These field visits help gaining higher productivity rates (hence profit for the farmers) and help as a reminder for the responsibility of loan repayment. So far, repayment rates by farmers to the bank have been high.

Enabling environment:

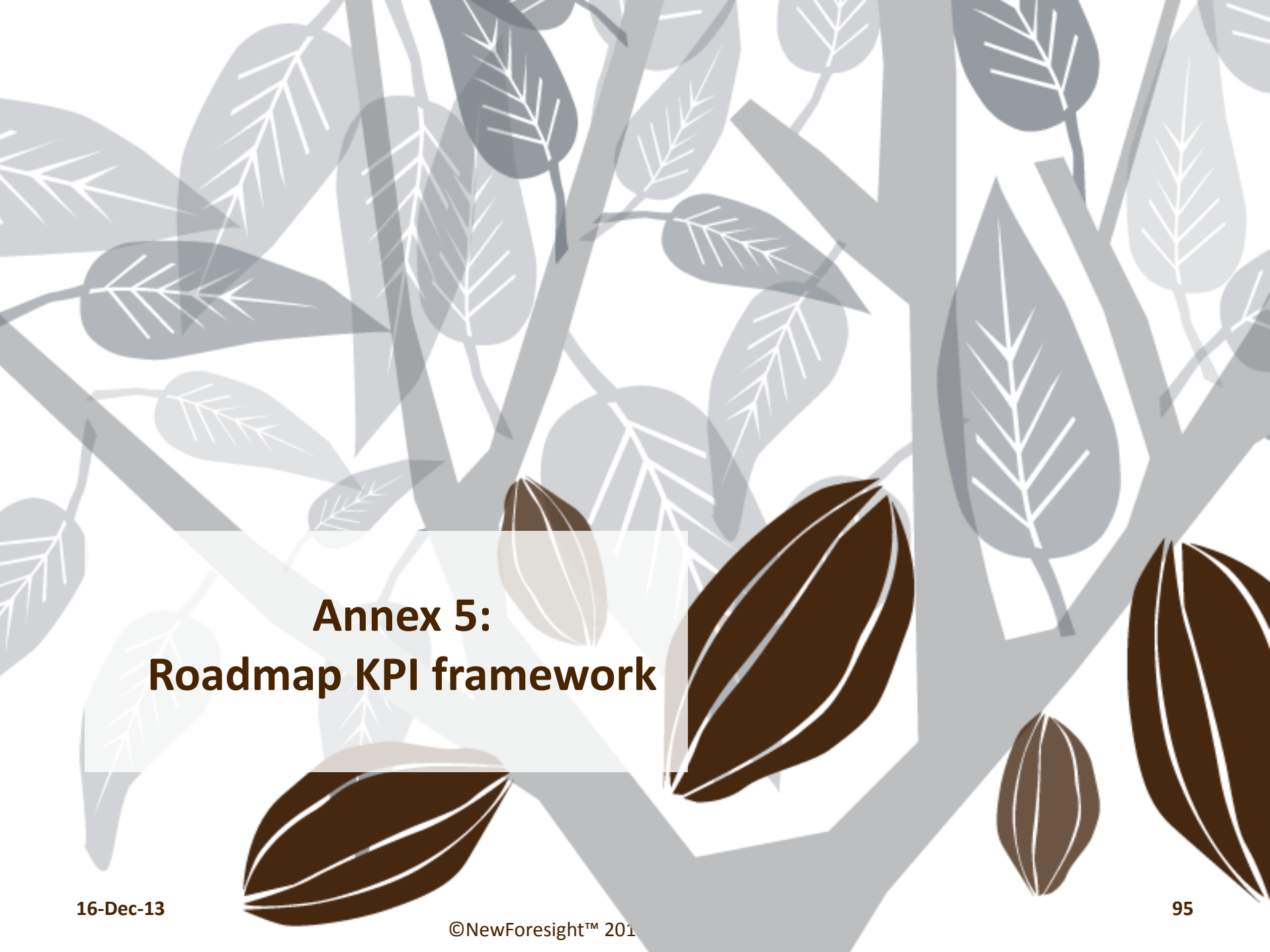
Role of Government

The Enabling Environment

The role of the government in this roadmap

The government is a key stakeholder in the CSP but modestly included in this document

- The reason this chapter is modest compared to the others is that this roadmap should (in relation to the government) primarily serve as a source for dialogue with the wider body of ministries and decision making bodies within the Indonesian government.
- As such the CSP is not in a position to make recommendations to the government. It should indicate its priorities and then the government can, in discussions with the CSP, decide how it can best support these priorities.
- This line of thinking was also clearly requested by government stakeholders consulted in the roadmap design process.
- The government is also building its own cocoa action plan. That will provide invaluable input to the implementation of this roadmap



Annex 5:
Roadmap KPI framework

KPI framework: accompanying notes

General notes

- The KPI framework presented on the next page is indicative;
- It is a set of suggestions that NewForesight believes reflects the key areas that should be measured and how they could be measured;
- The list is kept short for a reason – these should be indicators overarching the program indicators of CSP stakeholders;
- The actual KPIs will be decided by the CSP as they start implementing on the priorities set in this roadmap;
- As much as possible the KPI framework should build on what stakeholders are already measuring – only if gaps exist should these be covered by additional indicators.

How to measure these KPIs

- It is strongly suggested to have these KPIs measured by stakeholders and aggregated by the CSP on a national level, rather than measured by the CSP;
- Similarly, focusing on the global level, it is suggested to build on the CocoaMAP database to effectively measure CSP stakeholder performance compared to other countries and programs.

Core indicator KPI framework

	KPI	Unit of measurement
Farm productivity	• Cocoa Farm Productivity (kg/hectare/year)	kg/ha/crop yr
Quality of farm output	• Price differential paid on farmer crop	$/kg sold
Land use	• Total Area of Land Managed for Cocoa Production	ha

KPI non-core indicator framework

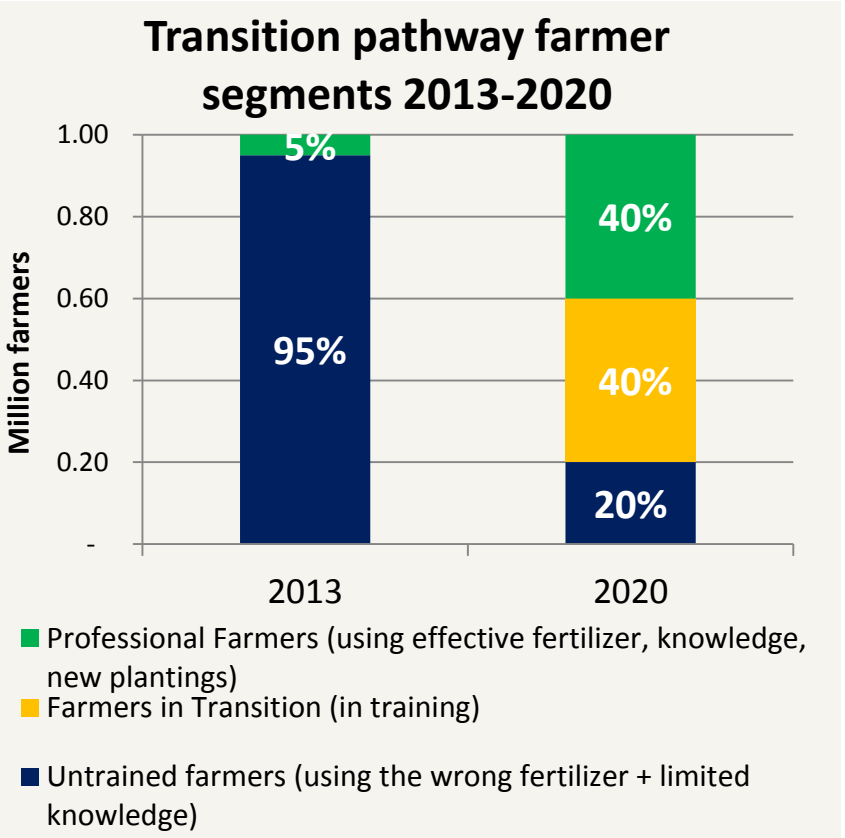
Roadmap Chapter	KPI	Unit of measurement
Agro Inputs	• Number of farmers applying the recommended amount of (the right quality) fertilizer	# of farmers
Planting Material	• Farms rehabilitation with high quality PM	Ha rehabilitated
Knowledge	• Total farmers trained • Adoption rate of GAPS by farmers (farmers practicing GAPs)	# of farmers % of total number of farmers (that successfully adopt)
Modes of delivery	• No of trainers trained • Farmers part of functioning farmer organization	# of trainers # of farmers
Access to Finance	• No of farmers receiving loan • Total volume of loans to farmers	# of farmers $ amount
Role of the government	• No of functioning district cocoa clusters • No of extension workers effectively integrated into program	# of clusters # of extension workers

Annex 6:
Financial Implications

Reaching the 2020 Roadmap goals: transition pathway

- The goal of the CSP is to make the Indonesian cocoa farmer have a sustainable business: one that provides the profits needed to attract a young generation of farmers and to remain competitive compared to alternative crops such as oil palm.
- Moreover, the CSP Roadmap targets mention a doubling of the current productivity level by 2020. This level will have to be established. Calculations are based on current estimates.
- The 2020 CSP Roadmap goal and targets are highly ambitious and will require a large number of the current Indonesian cocoa farmer base to effectively adopt the practices from the Professional Farmer Package as described in the Roadmap.
- To achieve such large outreach, a phased approach is required where each year a large group of farmers will gain access to a 4-year Professional Farmer Package Program (see below) and successfully adopt it.
- The graph on the right indicates the required transition in farmer segments if CSP Roadmap goals are to be reach by 2020

Professional Farmer Package Program	Year 1	Year 2	Year 3	Year 4
Knowledge training	Yes	Yes	Yes	-
Grafting (new planting material)	25% of farm	25% of farm	25% of farm	25% of farm
Effective fertilizer use	Yes	Yes	Yes	Yes
Access to finance	Yes	Yes	Yes	Yes



Assumptions:

Average farm size:	1 ha
Total farmers:	1,000,000 farmers

Yields (kg/ha):

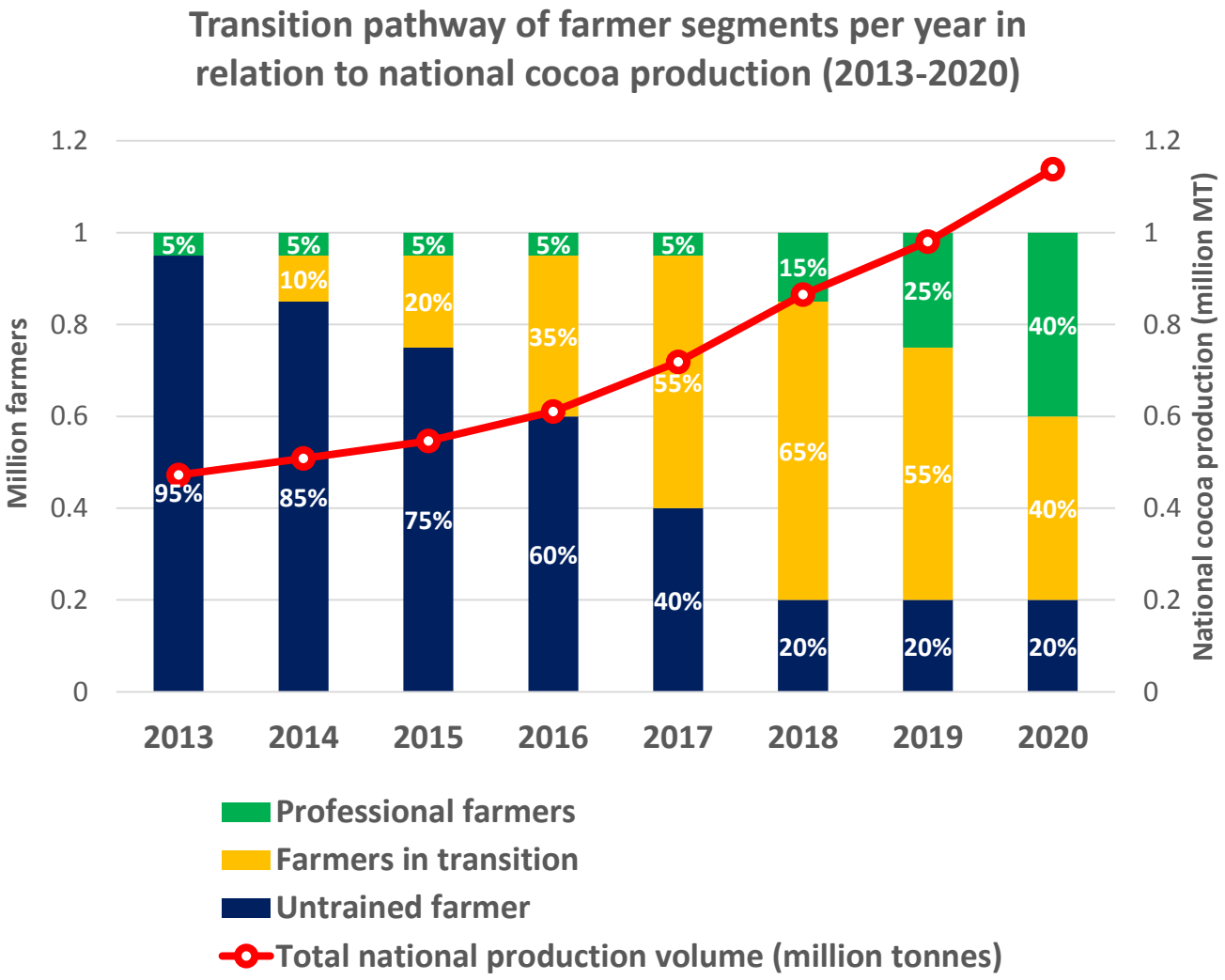
Untrained farmer (wrong fertilizer + limited knowledge) =	400
Farmer in transition (receiving training) =	1000
Professional Farmer (completed package training) =	1850

Transition pathway of farmer segments and national production

By applying a phased approach and targeting strategy to get 40% of the total farmer population to be a 'Professional Farmer' and 40% 'Farmer in Transition' by 2020, the national cocoa production of Indonesia is estimated to reach to more than 1 million tons in 2020 (see figure).

The figure shows the phased approach of the transition pathway. Each year an increasing number of farmers are enabled to start adopting the Professional Farmer Package.

The numbers shown in the graph assume successful adoption only. For that to happen, industry will have to take into account the diffuse nature of input distribution and training retention rates when calculating the necessary investments.



Organizing the delivery of the Professional Farmer Package: *level of effort*

The delivery of the Professional Farmer Package to the target group of cocoa farmers can happen in multiple ways (see Roadmap section on Modes of Delivery and Organization). The current financial calculations are based on a combined approach of extension services and farmer organization (the two outreach models most widely accepted by CSP members). The establishment of extension facilities will provide the needed infrastructure for farmer training. Farmer organization is aimed to facilitate the access to inputs, finance and training to enable the outreach to such large number of farmers. Moreover, there will be costs related to the actual training, production of a high number of improved planting material, fertilizer and access to finance schemes.

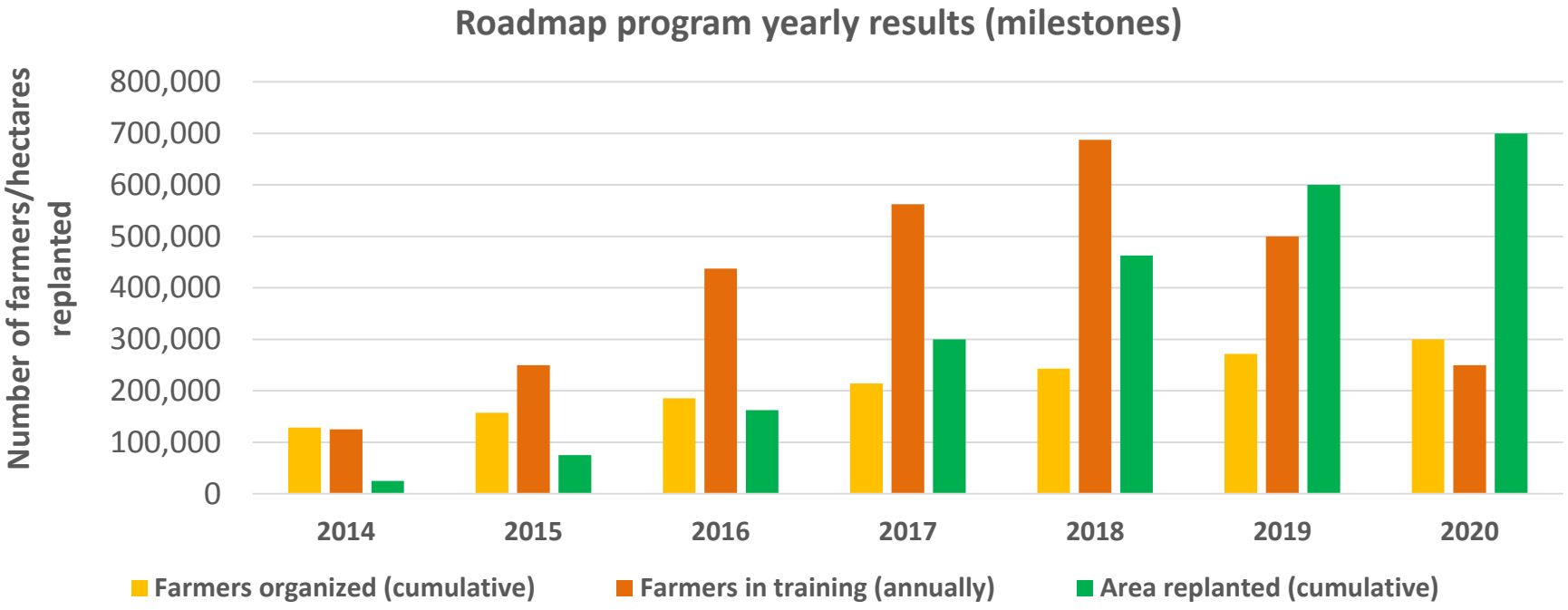
Component		Description and goals
	Training	Provide 3 year training program in Knowledge component to target farmers (PsPSP + advanced modules such as grafting)
	Extension facilities	Provide the necessary infrastructure for effective outreach to farmers (using a 'hub' & 'spokes' approach with central and satellite extension offices)
	New planting material	Enable distribution of improved planting material to support 75% of farmer population to rehabilitate 100% of their land by 2020
	Fertilizer	Farmer will finance his own fertilizer purchase (assisted by access to finance scheme)
	Access to Finance	Costs of a finance scheme to pre-finance fertilizer purchase (cost=non-repayment rate)
	Farmer Organization	Organize additional 20% of total farmer population in cooperatives (10% of total cocoa farmers is already organized)

Organizing the delivery of the Professional Farmer Package: *level of effort - milestones*

The level of effort required to reach the CSP 2020 targets can be translated in annual milestones.

The graph below shows:

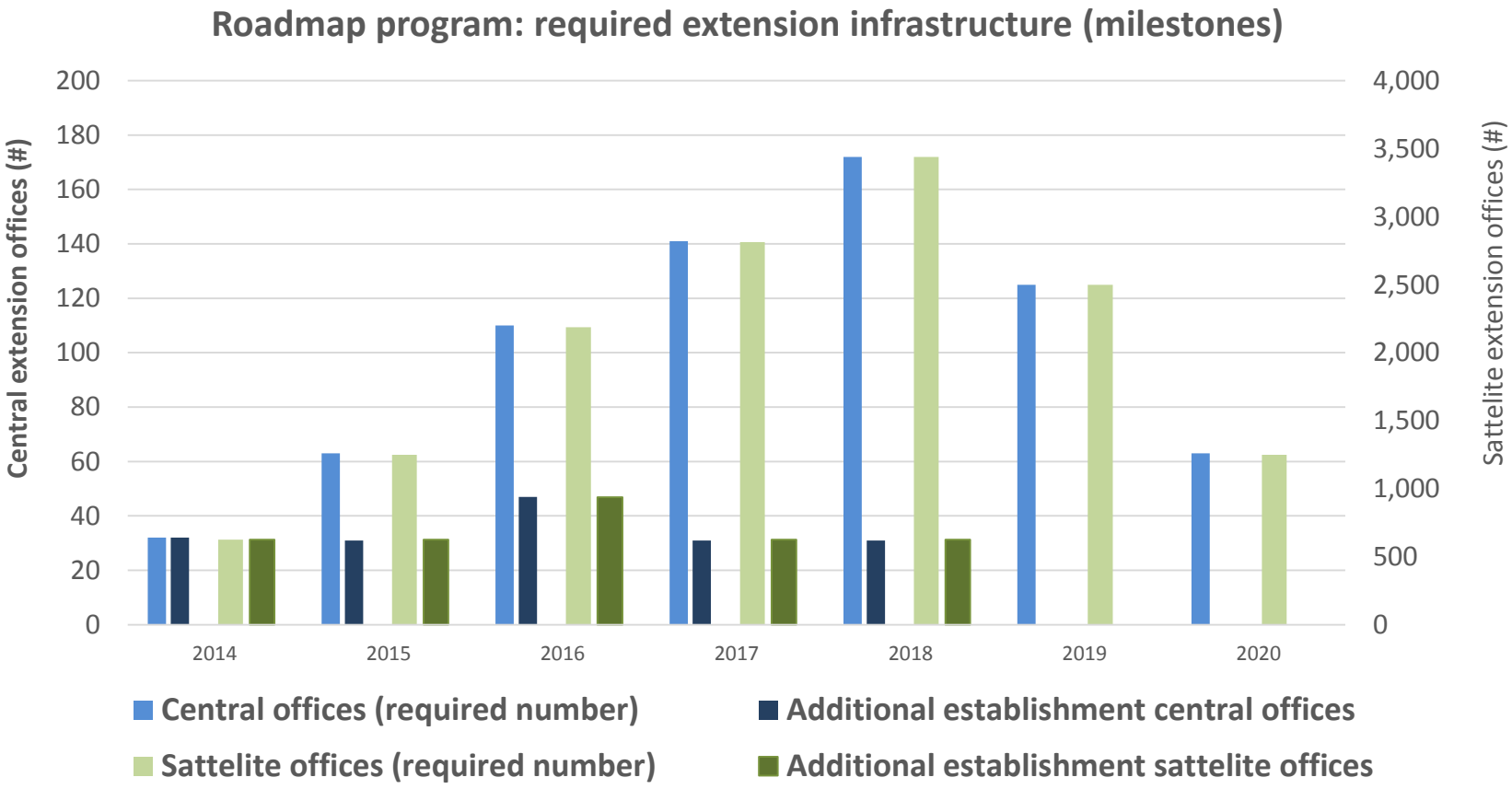
- How many farmers have to be organized yearly towards 2020 (cumulatively)
- How many farmers will be in the 4 year Professional Farmer Package training program each year
- How much land has to be replanted with improved planting material annually (cumulative)



Organizing the delivery of the Professional Farmer Package: *level of effort - milestones*

This graph presents the extension services infrastructure required to train the large numbers of farmers each year (as indicated in the previous slide):

- The total number of required central and sattelite offices (increases gradually towards 2018)
- The additional number of offices that will have to be built each year



Financial implications

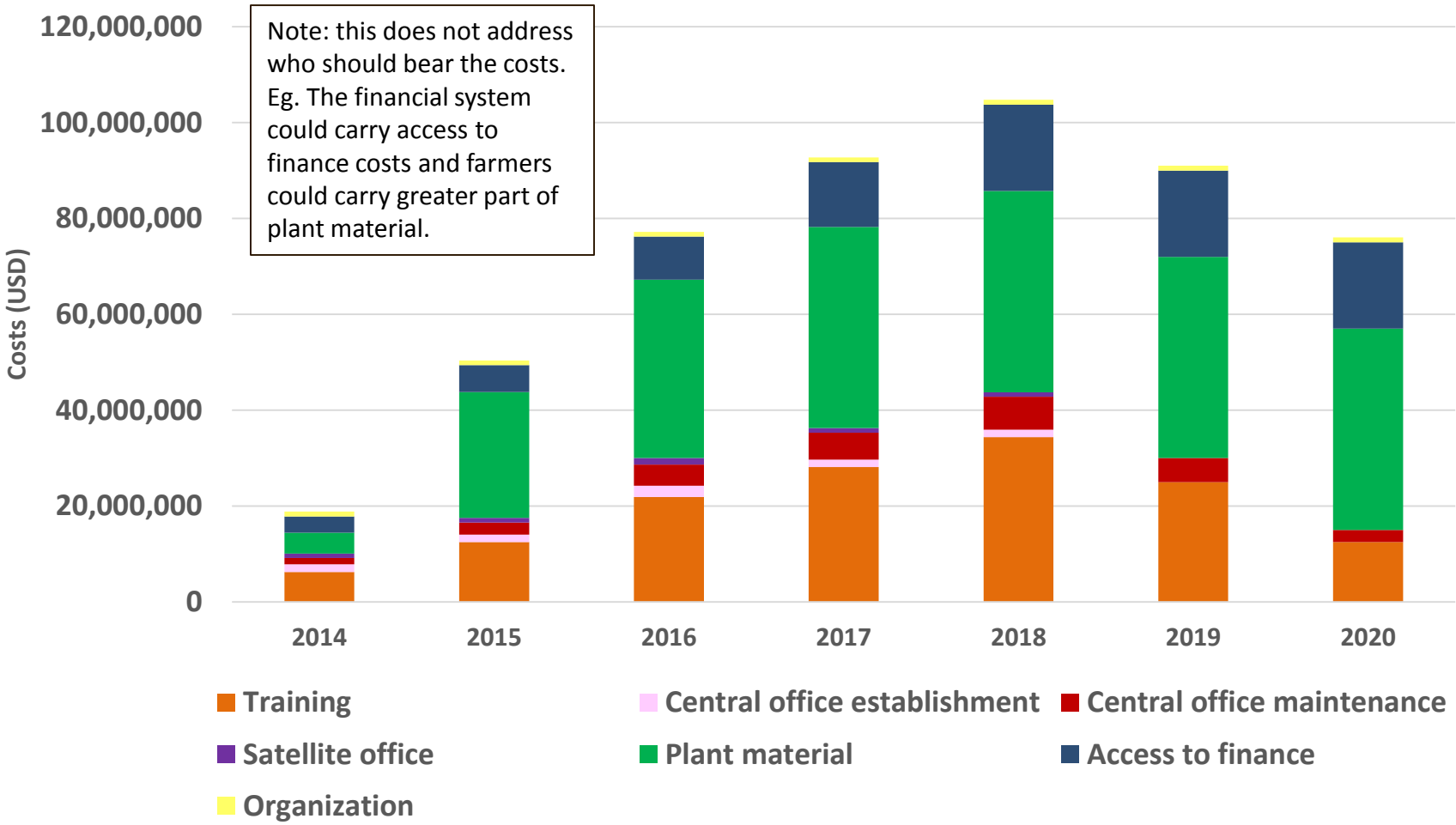
Working assumptions (costs in USD)

Component		Cost per farmer/entity
	Training	Training professional farmers: $50 /year/farmer (PsPSP + advanced modules such as grafting), 3 years duration Correction for an 80% retention rate
	Extension services	Establishment cost 1 satellite = 200 farmers = $1,500 Establishment cost 1 central = 4,000 farmers = $50,000 Maintenance cost 1 central = $40,000
	New planting material	Work towards a yearly provision of 60 million improved plantings of $0.70pp (lumped price for SE, budwood, orthotropic/plagiotrophic shoot gardens). This is additional to the 20 million plants annually produced by ICCRI and the 5 million by private enterprise.
	Fertilizer	Paid by the farmer
	Access to finance*	Coverage cost of the average failure rate of repayment (10%) of farmer loans for fertilizer (based on the annual total cocoa fertilizer market with 500kg/farmer x 0.90USD/kg) and 50% of farmers in need of access to credit)
	Farmer organization	$35 per farmer

* Risk sharing costs, who will carry them depends on decisions made (banks, industry, government)

Financial implications

Calculation of annual costs per component



Total Roadmap Costs (2014-2020): **511 million USD**

Annex 7:
List of people consulted

List of people consulted for the Roadmap

Name	Organization
Hasrun Hafid	ACDI VOCA Indonesia
Peter McMahon	ACIAR
Jeff Neilson	ACIAR
Karlo Purba	ADRA
A. Sulaiman Husain	APKAI Sulsel
David Ngu	Armajaro
Pither Sutardji	Armajaro
Firman Bakrie	Askindo
Zulhefi Sikumbang	Askindo
Muh. Dakhri Sanusi	ASKINDO Sulsel
Yusa Rasyid Ali	ASKINDO Sulsel
La Odi Mandong	ASKINDO Sulsel
Ir. Yusa Rasyid Ali	ASKINDO Sulsel
La Odi Mandong	ASKINDO Sulsel
Jim Tomecko	AUSAID
Angela Clare	AUSAID

Name	Organization
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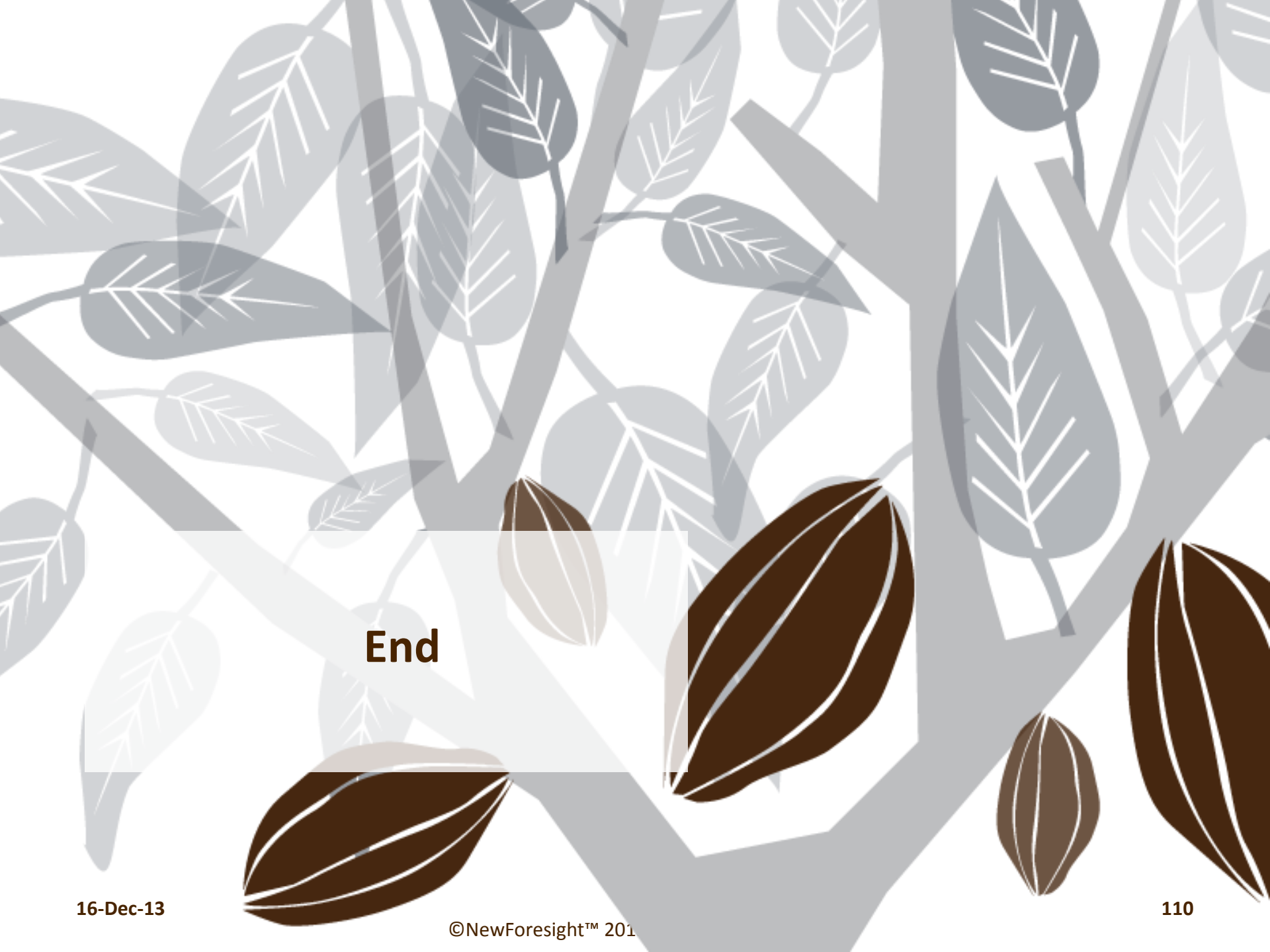
Kartika Fauziah	BPTP Sulsel
Dr. Sahardi Mulia	BPTP Sulsel
Thomas Jasman	BT Cocoa
Yusup Saleh	BT Cocoa
Zainal Laugu	Cargill
Dr. Ir. Sapta Raharja	Cocoa Innovations Project
Cornelis de Wolf	Concern Universal
Ina Murwani	Continaf - Nedcom
Dr. Sutanto	Dewan Kakao Indonesia
Dr .H. Burhanuddin Mustafa	Dinas Perkebunan Sulsel
Mr. Supriyatno	Dinas Perkebunan SulBar
Ms. Nurbeti	Dinas Perkebunan SulBar
Mr. A. Syarifuddin	Dinas Perkebunan SulBar
Ir. Azwar	Direktorat Tanaman Rempah dan Penyegar

List of people consulted for the Roadmap (continued)

Name	Organization
Alfons Urlings	EU/EC
Drs. H. Hasanuddin Darjo	Forum Kakao Aceh
Helvi Yudho	Forum Kakao Aceh
Pujiyanto	ICCRI
Dr. Misnawi	ICCRI
Daniel Hazman	IDH
Annisa Lucky	IFAD
Rick Van Der kamp	IFC
Andi Wahyuni A. Baso	IFC
Baharudin Naru	Local trader Kutacane
Mr. Lashot	London Sumatera
Mr. Ebenhaezer	London Sumatera
Ruud Engbers	Mars Incorporated
Fay Fay Choo	Mars Incorporated
Peter van Grinsven	Mars Incorporated
A. Sitti Asmayanti	Mondelēz International

Name	Organization
Wisman Djaja	Nestlé
Saurabh Suri	Olam
Marc Donaldson	Petra Food
Noel Janetski	PT Koko Smart
Peter Sprang	Rainforest Alliance
Petra Tanos	Rainforest Alliance
Muh. Agra Putra	Rainforest Alliance
Manfred Borer	SwissContact
Suharman	SwissContact
Giri Arnawa	SwissContact
Prof. Sikstus Gusli	Universitas Hasanuddin
Mercedes Chavez	UTZ Certified
Rogier Eijkens	VECO Indonesia
Imam Suharto	VECO Indonesia
Peni Agustyanto	VECO Indonesia



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