Identifying pathways for achieving transformational change in forest partnerships using Qualitative Comparative Analysis

Partnerships for Forests

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Contents

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Abbreviations

FP	Forest Partnership
M&E	Monitoring and evaluation
MEL	Monitoring, evaluation and learning
P4F	Partnerships for Forests
PES	Payment for Ecosystem Services
QCA	Qualitative Comparative Analysis
SLU	Sustainable Land Use

Rimba Raya Biodiversity Reserve InfiniteEARTH (Lestari Capital)

Executive summary

Cocoa processing

Partnerships for Forests (P4F) is a UK Government-funded programme that catalyses investment in sustainable forest and land use. The P4F-supported projects ensure that the private sector, public sector and communities gain shared value, so protecting and restoring forests while generating sustainable income streams for communities and businesses. As part of its work to understand outcomes, P4F's monitoring, evaluation, and learning team used Qualitative Comparative Analysis (QCA) to identify which combination of factors is most likely to make these projects transformative. This allowed the programme to trial QCA for use in similar programmes and provided learning about which activities to focus on to produce the most transformative outcomes in any potential follow-up phase or future projects.

The QCA involved scoring 20 P4F-supported projects – ten considered to be transformative and ten not – against ten factors that are likely to contribute to transformational change, based on the P4F Framework for Transformative Change. Each project was scored to indicate whether the factors were present (score = 1) or absent (score = 0). An assumption was made that all ten factors are likely to contribute to transformational change if present, and not hindering it. The analysis showed three possible causal pathways (see Table 1) that contribute to transformational change. The *Investment model* factor was present in all transformative projects and none of the non-transformational ones. Other key factors identified in the analysis are *Enabling policies, Public economic incentives and Mindset shift*.

	Cases covered in total (raw)	Cases uniquely covered	Causal pathway	Outcome
01	8	3	mindset shift * sector-wide alignment * m&e * investment model * market demand * technological innovation * support services	
02	6	1	mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * support services	Contribution to transformational change
03	6	1	mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * technological innovation * public economic incentives	

TABLE 1 | QCA solution of three causal pathways[1]

Reflections on the methodology include that:

- QCA is best used to identify patterns in complex situations and to understand why an outcome happens in some situations but not others;

- Due to the significant work involved, QCA's use should be limited to questions central to a programme's strategy;

- In similar programmes, QCA could be used to answer questions such as: 'What factors create an enabling environment to unlock investments into a Sustainable Land Use (SLU) economy, that benefits both nature and people?'; 'What types of demand-side measures are most effective in supporting an enhanced market for sustainably sourced products?'; 'How can a SLU business model best support social impact, especially on gender, equality, and diversity?'; 'What factors are required for a business model to be replicated or scaled?' and 'What factors can bring about behaviour change in business, investment, or consumer practices?'

1. In QCA, * signifies 'and', ~ signifies 'absence of'

Introduction

Partnerships for Forests (P4F) is a UK Government-funded programme that catalyses investment in sustainable forest and land use. The projects it supports ensure that the private sector, public sector and communities gain shared value, so protecting and restoring forests while generating sustainable income streams for communities and businesses. Over the past eight years, P4F has incubated and strengthened numerous Forest Partnerships (FPs), showing how different economic models that deliver benefits for nature, communities, and businesses can and do work.

The programme was designed and delivered to contribute to transformational change, with investment flowing into deforestation-free value chains and business models that deliver the positive environmental and social benefits required to halt and reverse deforestation across the tropical forest belt. Such transformational change is complex, and difficult to clearly capture and demonstrate.

The term 'transformational change' is often used in development programmes aiming to bring about lasting and inclusive change in a complex issue. Although the exact nature, definitions and pathways to transformational change vary from context to context, transformational change is always hard to achieve, and success usually lies outside a single programme's mandates, capabilities, and timeframes. In most cases, the best a programme can hope for is to contribute to transformational change in their specific area, and to gather and share learning about what does and doesn't work.

From 2019 to 2021, P4F was supported by independent evaluation managers[2]. They developed a Transformative Change Framework which explored what transformational change means for P4F and how to assess it, providing a methodology

and empirical insights (Nelson et al. 2021). This paper builds on that framework, using Qualitative Comparative Analysis (QCA) to identify key factors that can contribute to transformational change in a programme like P4F. The findings set out in this report aim to contribute to our understanding of if and how P4F's theory of change of supporting FPs has contributed to transformational change.

The primary research question that this report seeks to answer is: What combination of factors lead to P4F FPs (see Figure 1) contributing to transformational change? The answer can provide insights in two key areas:

- A better understanding of the characteristic profile of a range of FPs that have been assessed as most likely to deliver transformational change;

- Examples of what combinations of characteristic may contribute or present a barrier to transformational change.

These insights may be useful to future programmes like P4F, and help guide portfolio development strategies for projects that are best placed to contribute to transformational change.

The report starts with a brief introduction to QCA, followed by an overview of the theoretical framework and definitions used, and of how cases were selected, coded, and analysed. It then presents and discusses findings about which conditions, or sets of conditions, are the most likely to support transformational change. Finally, the report shares learning and recommendations on strengths and drawbacks of using QCA as a methodology for development programmes similar to P4F.

2. A consortium of LTS International Limited, part of the NIRAS Group, Natural Resources Institute, Greenwich University and Aidenvironment.

FIGURE 1 | Partnerships for Forests

P4F catalyses investments in which the private sector, public sector and communities can achieve shared value from sustainable forests and sustainable land use. The eight-year, UK Foreign, Commonwealth and Development Office-funded programme operates in Central, East and West Africa, South East Asia and Latin America.

The programme's main focus is supporting the development of Forest Partnerships (FPs) – between private sector companies, public sector actors and communities that depend on forests for their livelihoods – that catalyse investment in forests and

sustainable land use businesses. The programme also supports measures that strengthen demand for sustainable commodities and activities that create enabling conditions for sustainable investment.

Through grants and technical assistance, P4F helps partners to get to market – from idea development and forming memorandums of understanding, to business planning, deal negotiation and piloting, and finally commercial scale-up. Decision gates at the different stages provide the opportunity to review the feasibility and success of FPs against specific criteria, determining further grant funding.

ENABLING CONDITIONS
Supporting initiatives that foster an improved business environment for investment in forests and sustainable land use
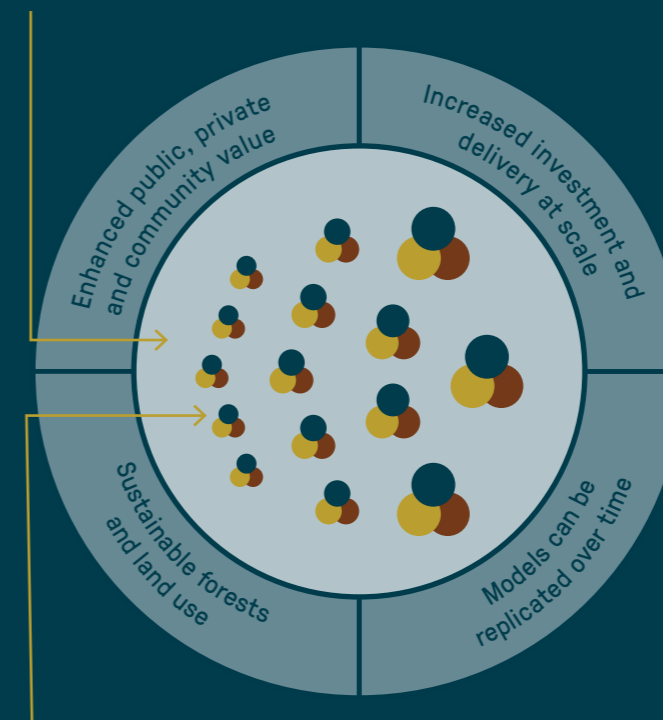
DEMAND SIDE MEASURES
An enhanced market for sustainably sourced products through public and private communities to sustainable sourcing

FOREST PARTNERSHIPS
Partnerships between the privet sector, and communities that generate returns from forests and sustainable land use that match or outperform those derived from unsustainable practices

● Public   ○ Private   ● Community

Labels within figure: Enhanced public, private and community value; Increased investment and delivery at scale; Sustainable forests and land use; Models can be replicated over time

About QCA

QCA is an evaluation methodology that allows the analysis of multiple cases in complex situations. It can help understanding of why change happens in some cases but not others by looking for patterns in the occurrence of conditions associated with those cases. QCA is particularly valuable in situations where there are not enough cases for statistical analysis and is best suited for use with between ten and 50 cases. While an increasing number of papers have been published on and using QCA, it remains a relatively niche evaluation methodology with software and guidance not entirely straightforward to use. To manage this, P4F worked with a consultant with experience of QCA and consulted publicly available guides (Pappas & Woodside 2021, Ragin 2017, Scholz & Simister 2017).

The first QCA step is to develop or identify a theory of change that includes 1) the change that is to be analysed – the outcome, and 2) a set of conditions – the factors – whose presence or absence may contribute to the outcome. The factors need to be independent of each other and the outcome. The second QCA step selects a set of cases that will be analysed, balanced between cases where the outcome was achieved and those where it was not. Each case selected must have been theoretically able to achieve the outcome, i.e., not hindered by external circumstances. In the third step, each case gets analysed against each factor and the outcome. To do this, qualitative data get converted into a quantitative score. In the crisp set QCA used in this study, the score was either '0' for the absence of the factor or '1' for its presence. To achieve this, there must be a clear definition of each factor and of what an absence or presence of that factor entails.

After all the cases are scored against each factor, the data are analysed. As an initial step, or if there are a very small number of cases, this can be done by scanning the scores by eye and looking for patterns. Most often though, QCA is done with help of a software. The software presents combinations of present and absent factors that lead to the outcome. These combinations are referred to as 'solutions'. In the final step, the solutions are interpreted. QCA is an iterative process, lopping between the data analysis and interpretation. During the interpretation, some factors or solutions might get dismissed – if,

A farmer climbs up a palm sugar tree to collect the sap at a forest in Sintang regency, West Kalimantan, Indonesia (Forestwise)

© Kamal Juffri for Panos Pictures / FOLU

for example, a solution cannot be explained in the context – or cases and scoring might get reviewed, and data re-analysed with a focus on only specific factors. The solution(s) produced should make sense to those who have worked in the context of the cases and have been tested for outliers. The results of the analysis can then be used to predict or improve performance of project activities.

Rationale for using QCA

The need to protect forests and landscapes – and to support their people, flora and fauna – is urgent, and P4F has ambitious goals to catalyse SLU investment across countries, commodities and business models with vastly differing political and socio–economic contexts. This urgency and complexity drive P4F's interest in understanding which factors contribute to impact. One part of this impact is 'transformational change', defined by the UK Government as "'change that catalyses further changes', enabling either a shift from one state to another (e.g., from conventional to lower-carbon or more climate-resilient patterns of development), or faster change (e.g., speeding up progress on cutting the rate of deforestation)" (UK Government 2023). The trial of QCA was decided to improve the programme's understanding of the complex environment, given the nature of transformational change and the likely variety of pathways that could lead there.

Methodology

Transformational Change Framework

Transformational change is difficult to define because the specifics of the desired change may be highly dependent on the context. In this report, transformational change is understood in terms of the P4F evaluation managers' framework (Nelson et al. 2021) as:

- Involving a fundamental shift in the functioning and dynamics of a socio–ecological system;

- Requiring a combined set of interventions (synchronous or appropriately sequenced and evolving over time) to change the 'rules of the game' and the capacity and motivation of sets of actors, leading to behaviour change towards a desired new system state;

- Involving shifts and changing the conditions that 'hold a problem in place' within and through:

  - Visible system conditions, such as policies, practices, and resource flows;

  - Semi-visible relationships, connections, and power dynamics; and

  - Invisible mindsets and norms.

It is important to note that the complexity of transformational change means that most development projects will not bring it about on their own or see it materialising during the programme period. In fact, the UK Government states that "the purpose of monitoring Transformational Change via KPI 15 is not so that a programme can be completed and report 'transformation achieved'. Rather, the purpose is to encourage thinking and programme design toward the sorts of transformations needed – to 'design in' learning from UK ICF programmes as they are implemented" (UK Government 2014). For that reason, the outcome in this analysis is about understanding contributions to, rather than achievement of, transformational change. 'Contributing to transformational change' is understood as:

- A new value chain or product that has the potential to widely transform a sector; or

- A pioneering operational model that can be replicated or scaled and that has the potential to significantly increase the environmental, social and economic benefits of the business; or

- A solution to a social or environmental sustainability issue for a product or value chain that has the potential to widely transform the sector.

The evaluation managers' Transformative Change Framework was used to develop the factors and definitions used in the QCA, as presented in Table 2.

Jagua tree seedlings (Ecoflora)

© P4F

TABLE 2 | Factors and their definitions

	01	02	03	04	05	06	07	08	09	10	
Factors	**Mindset shift:** where key actors within the FP and its supply chain demonstrate/ express a mindset shift, commitment, and sense of ownership, to implement practice/ behavioural changes	**Sector-wide alignment and collaboration:** where the FP benefits from and takes part in sector-wide coordination and dialogue to establish shared visions, strategies, and investments supporting practice and behavioural changes	**Governance innovation:** where the FP is part of (or has set up) a formal governance structure to support democratic governance in producer groups, value chains, landscapes, and sectors	**M&E:** where the FP has mechanisms for monitoring and learning, to enable adaptive adjustments based on changing conditions, fostering practice, and behavioural changes through continuous learning	**Investment model:** where the FP has demonstrated a viable investment model	**Enabling policies** where the FP benefits from enabling policies that drive mainstream adoption of sustainable business models and investment propositions	**Market demand:** where the FP benefits from growing demand for sustainably produced products, replacing less sustainable options in the market	**Technological innovation:** where the FP adopts viable, efficient, sustainable, and inclusive practices within a more sustainable farming/ production/ service delivery system, including potential disruptive innovations like blockchain and AI	**Support services:** where the FP benefits from accessible and viable sector support services and finance models that effectively sustain and support desired practices and behavioural changes	**Public economic incentives:** where the FP benefits from aligned economic incentives that support and sustain desired practices and behavioural changes	**Factors**
Scored 0 if	SLU is not committed to by key actors in the FP and its value chain	Actors in FP's sector are not collaborating on a wider vision and strategy for the sector	The FP is not part of a formal governance structure with other value chain actors	The FP has not set up M&E mechanisms for its operations	The FP has not verified investments under RFI-008	No sector-related policies that drive mainstream adoption of sustainable business models and investment propositions are present within the FP's (national, regional, local) jurisdiction	No current demand for the sustainable products/services the FP offers, e.g. because the product/service is new, unknown or redundant	The FP has not adopted innovative technologies	No support services and finance models are available, viable and accessible to the FP	No public economic incentives in the FP's jurisdiction support SLU	**Scored 0 if**
Scored 1 if	Key actors in the FP and/or its value chain are showing commitment to SLU	There is an active dialogue and shared visions and strategies with other actors in the FP's sector	The FP is part of a formal governance structure with other value chain actors	The FP has set up M&E mechanisms for its operations	The FP has verified investments under RFI-008	Sector-related policies that mainstream adoption of sustainable business models and investment propositions are present within the FP's (national, regional, local) jurisdiction	Established and growing demand for the sustainable products/services the FP offers, e.g. the product is retailed in accessible stores, the FP has verified revenue outcome results, relevant stakeholders know about the product/ service	The FP has adopted innovative technologies	Support services and finance models are available, viable and accessible to the FP	Public economic incentives in the FP's jurisdiction support SLU	**Scored 1 if**

Case selection

Twenty cases were selected from the 100+ FPs in the P4F portfolio based on:

- An equal number of cases considered to have/ not to have contributed to transformational change;

- Availability of evidence and information;

- Representation across regions and value chains.

Cases of success[3] were partly selected due to being flagship projects for their regions or sectors, and so appearing in P4F ICF KPI 15 reporting[4]. Unsuccessful cases were selected from projects that had passed the entire P4F approval and grant award process – so having had the same opportunity as other projects to contribute to transformational change – but where the expected impact did not materialise.

Finally, all selected cases are FPs, which impacts on the factors they are able to influence directly (e.g. actions they may take, initiatives they may take part in) and the wider conditions they may or may not be able to benefit from, depending on whether these are present or not (e.g. enabling policies, market demand, etc.). For further information on FPs, please refer to Figure 1.

Data sources and coding of the cases

To ensure a coherent methodology and understanding of the definitions and requirements of QCA, the cases were coded against each factor by Project Officers and the regional team that knew each case best, in collaboration with the P4F MEL team. An anonymised crisp data set[5] is presented in Table 3.

3. In this report, 'successful' cases are those that were scored 1 for the outcome (contribution to transformational change) and 'unsuccessful' cases are those that were not. Note that this is not an overall judgement of the value and performance of the projects, only on this particular outcome.
4. International Climate Finance (ICF) is Official Development Assistance from the UK to support developing countries to reduce poverty and respond to the causes and impacts of climate change. ICF KPI 15 looks at the extent to which an ICF-supported intervention is likely to lead to transformational change. P4F has reported against this indicator annually. For further information, see UK Government, 2023.
5. 'Crisp Set' Analysis is done on binary coding of factors and outcomes, indicating their presence (1) or absence (0) in every case, as opposed to a 'Fuzzy Set' Analysis which allows for partial scores (e.g. 0.5).

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TABLE 3 | QCA crisp data set

Region	Commodity		Transformational change	Mindset shift	Sector-wide alignment	Governance innovation	M&E	Investment model	Enabling policies	Market demand	Technological innovation	Support services	Public economic incentives
South East Asia	Finance		1	1	1	1	1	1	1	1	0	1	0
West and Central Africa	Cocoa		1	1	1	1	1	1	1	1	1	1	1
Latin America	Rubber		1	1	1	1	1	1	1	1	1	1	1
West and Central Africa	Palm Oil		1	1	1	1	1	1	1	1	1	1	1
West and Central Africa	Non-timber forest products and cocoa		1	1	1	1	1	1	1	1	1	0	0
East Africa	Timber		1	1	1	1	1	1	1	1	1	1	1
East Africa	Coffee		1	1	1	1	1	1	1	1	1	0	1
South East Asia	Non-timber forest products		1	1	1	0	1	0	1	1	1	1	0
Latin America	Agribusiness		1	1	1	0	1	1	1	1	1	1	0
Latin America	Non-timber forest products		1	1	1	0	1	1	1	1	1	1	0
South East Asia	Biofuel		0	1	1	1	1	0	1	1	1	1	0
South East Asia	Non-timber forest products		0	0	1	1	1	0	0	1	1	0	1
East Africa	Timber		0	0	0	1	1	0	0	1	1	1	0
South East Asia	Non-timber forest products		0	1	1	0	1	0	1	1	1	1	0
West and Central Africa	Palm oil		0	1	1	1	1	0	1	1	1	1	0
East Africa	Timber		0	1	1	1	0	1	1	1	0	1	0
East Africa	Timber		0	1	1	1	0	0	0	1	0	1	0
West and Central Africa	Palm oil		0	1	0	1	0	0	0	0	0	1	0
Latin America	Soy		0	0	1	0	0	0	0	0	1	0	0
Latin America	Cattle		0	0	1	0	0	0	0	1	0	0	0

Data analysis

This QCA used fsQCA software due to its relative ease of use and free availability. The software produces truth tables – a tabular representation of all logically possible configurations of factors. All ten factors presented in Table 2 were included and analysed against the outcome.

Overall prevalence

While the QCA provides configurations of factors leading to an outcome, scanning the data by eye or looking at the overall prevalence of factors in successful and unsuccessful cases provides insights into patterns and the relative importance of factors for all cases, and successful cases in particular.

Some initial reflections include:

- *Investment model* seems to be the 'gatekeeper' factor, scoring 1 in all successful and 0 in all unsuccessful cases. However, unlike other factors used in the QCA, the likelihood of raising investment is a requirement of P4F grant approval and so this finding was perhaps to be expected.

- *Enabling policies* and *Public economic incentives* show the next highest difference in prevalence between successful and unsuccessful cases, suggesting the importance of a supportive public environment for SLU businesses.

- *Mindset shift, M&E, Sector-wide alignment and Market* demand all scored 1 for all successful cases. However, they also have a relatively high prevalence with unsuccessful cases, suggesting they're not necessarily determinants of the outcome.

TABLE 4 | Prevalence of factors in P4F cases

Factors	Overall prevalence	Prevalence in success cases	Prevalence in negative cases
Sector-wide alignment	18 / 20 (90%)	10 / 10 (100%)	8 / 10 (80%)
Market demand	18 / 20 (90%)	10 / 10 (100%)	8 / 10 (80%)
Mindset shift	16 / 20 (80%)	10 / 10 (100%)	6 / 10 (60%)
M&E	16 / 20 (80%)	10 / 10 (100%)	6 / 10 (60%)
Support services	16 / 20 (80%)	9 / 10 (90%)	7 / 10 (70%)
Technological innovation	15 / 20 (75%)	9 / 10 (90%)	6 / 10 (60%)
Governance innovation	12 / 20 (60%)	7 / 10 (70%)	5 / 10 (50%)
Enabling policies	13 / 20 (65%)	9 / 10 (90%)	4 / 10 (40%)
Investment model	10 / 20 (50%)	10 / 10 (100%)	0 / 10 (0%)
Public economic incentives	7 / 20 (35%)	6 / 10 (60%)	1 / 10 (10%)

QCA findings:
which causal pathways lead to transformational change?

The fsQCA analysis assumed that the presence of each factor would contribute to, but never hinder, the outcome. This means that the difference between factors was their relative importance in achieving the outcome, or the extent to which they worked well in combination with other factors in achieving the outcome. The interpretation of data focussed on the causal pathways identified by the parsimonious and intermediate solutions.

Reading fsQCA outputs

The truth table analysis – the most suitable for a crisp data set – provides the user with three solution sections: complex, parsimonious and intermediate. These solution types treat the possible combinations of factors not represented in the selected cases (i.e., the counterfactual, absent combinations) in different ways:

- **Complex solution:** absent combinations are all set to false, i.e. as if there are no counterfactuals (this is unlikely to be accurate, so the complex solution will be ignored in this analysis);

- **Parsimonious solution:** a simplified version of the complex solution that excludes the counterfactual cases but presents the most important factors, which must be included in any solution;

- **Intermediate solution:** part of the complex solution and includes the parsimonious solution but includes only theoretically possible counterfactuals.

Every solution section includes information on the file, model (set outcome and factors) and algorithm used, and the frequency and consistency cutoffs. Finally, at least one solution pathway is presented, each with:

- **Raw coverage:** the proportion of cases with the same configuration of factors;

- **Unique coverage:** the proportion of cases that can be fully explained with the solution pathway (cases that are not covered by other solution pathways);

- **Consistency:** the degree to which cases in each solution pathway are consistent with the outcome;

- **Solution coverage:** the proportion of cases in the outcome that is explained by the complete solution;

- **Solution consistency:** the degree to which cases in the solution are a subset of the cases in the outcome.

FIGURE 2 |
Illustration of an intermediate solution provided by fsQCA

(Ragin 2017, Pappas & Woodside 2021)

```
--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 1
Assumptions:

raw          unique
coverage   coverage   consistency

----------  ----------  ----------
Mindsetshift*Sectorwidealignment*~Governanceinnovation*MandE*Investmentmodel*Marketdemand*
Technologicalinnovation*Supportservices*~Publiceconomicincentives                   0.3
0.3        1
Mindsetshift*Sectorwidealignment*Governanceinnovation*MandE*Investmentmodel*Enablingpolici
es*Marketdemand*Technologicalinnovation*Publiceconomicincentives                    0.6
0.6        1
Mindsetshift*Sectorwidealignment*Governanceinnovation*MandE*Investmentmodel*Enablingpolici
es*Marketdemand*~Technologicalinnovation*Supportservices*~Publiceconomicincentives  0.1
0.1        1
solution coverage: 1
solution consistency: 1
```

Parsimonious solution

In this analysis, the parsimonious solution is *Investment model*, which scored 1 for all the successful cases and none of the unsuccessful cases, suggesting that it is the only single factor that can determine the success of transformational change. This cannot, however, be confirmed as there is no single successful case in the sample where *Investment model* was the only factor that scored 1, so it may well not be sufficient to achieve the outcome on its own. There are also several reasons why this solution should be considered in a more critical light. Firstly, in P4F's grant approval process, a project's likelihood to raise investment is more important than any of the other factors used in this QCA. Secondly, successful raising of investment is a condition for an FP to move past review stages of the grant approval process (see Figure 1), so only projects (or cases) that have successfully raised investment, continue to receive grant support from P4F beyond a certain stage.

Intermediate solution

The intermediate solution showed three causal pathways to transformational change[6]:

TABLE 5 | Full intermediate solution for positive outcome, provided by fsQCA

Outcome — Contribution to transformational change	Mindset shift * sector-wide alignment * m&e * investment model * market demand * technological innovation * support services	Mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * support services	Mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * technological innovation * public economic incentives
Consistency	1	1	1
Raw coverage (# of cases)	0.8	0.6	0.6
Unique coverage (# of cases)	0.3	0.1	0.1
# of cases explained	8	6	6
# of cases explained uniquely	3	1	1

Overall solution

Consistency	1.00
Coverage	1.00
Simplifying assumptions	All factors must be present

6. In QCA * signifies 'and', ~ signifies 'absence of'

There is a high repetition of the same cases across the three pathways (i.e., relatively high raw coverage and relatively low unique coverage in each pathway). Overall, the pathways outlined in Table 5 show that:

- Mindset shift * sector-wide alignment * M&E * investment model * market demand were present in all successful cases;
  - * technological innovation were present in nine out of ten successful cases;
    - * governance innovation * enabling policies * public economic incentives were present in six out of ten successful cases;
    - * support services were present in three out of ten successful cases;
  - * governance innovation * enabling policies * support services were present in one out of ten successful cases.

Analysis of negative outcomes

More insights were gained by running an analysis of setting the outcome to not achieving or contributing to transformational change. For this, all factors were set to 'absent' based on the assumption that their absence would be a factor in not contributing to transformational change.

There was again a single pathway for the parsimonious solution for this analysis, which was ~investment model. There were two pathways for the intermediate solution in this analysis:

TABLE 6 | Full intermediate solution for negative outcome, provided by fsQCA

Outcome — No contribution to transformational change	~Investment model * ~Public economic incentives	~Mindset shift * ~Investment model * ~Enabling policies * ~Support services
Consistency	1	1
Raw coverage (# of cases)	0.9	0.3
Unique coverage (# of cases)	0.7	0.1
# of cases explained	9	3
# of cases explained uniquely	7	1

Overall solution

Consistency	1
Coverage	1
Simplifying assumptions	All factors must be absent

Three causal pathways to transformational change

To understand more about the intermediate solution's three 'pathways of success' and their associated lessons and conclusions, selected cases were looked at in detail. Each case selected is uniquely covered by the pathway they illustrate.

Causal pathway 1: mindset shift * sector-wide alignment * m&e * investment model * market demand * technological innovation * support services

Case Study
Forestwise Illipe nut

What is the project about?

Forestwise is an ethical commodity trader operating in West Kalimantan, Indonesia. It is developing a market for forest products that both increases the economic value of the remaining forests and discourages deforestation by providing economic benefits for the communities. Forestwise purchases illipe nuts at premium prices directly from communities and the communities commit to no further deforestation. Forestwise's P4F-supported approach focuses on three steps:

1. Conserving rainforests by inviting farmers, communities and cooperatives to join Forestwise and receive technical assistance from on how to best protect their land;

2. Setting up sustainable and efficient supply chains by providing efficient processing technologies for communities to get the most value out of the land they're managing;

3. Selling and distributing the sustainably harvested and fairly sourced raw materials in Borneo and internationally

What transformational change was observed?

Traditionally, illipe nut was only collected for local markets and was not considered for use by industries. Now, it is started to be used instead of shea and cocoa butter by the cosmetics, food, and pharmaceutical industries. While shea and cocoa come mainly from farmed plantations, illipe nut comes from standing forests, providing increased value and protection of these forests. This offers a new, sustainable alternative for important global industries, with significant potential for growth. By October 2023, Forestwise had forest protection agreements with six villages, covering a combined forest area of 37 thousand hectares. Illipe sales have increased the average annual income of over 1,000 community collectors by offering premium prices three to six times higher than the market price. Forestwise aims to keep adding villages, increasing the area of forest protected to 500 thousand hectares and reaching 10 thousand beneficiaries by 2030 (Forestwise n.d.).

How did the causal pathway produce the outcome?

Mindset shift: Forestwise was set up with the specific purpose of preserving forests and providing benefits to communities through the commercialisation of non-timber forest products (NTFPs). Impact has been a driving force for Forestwise.

Sector-wide alignment: While the illipe nut butter market is still nascent and the NTFP market is fragmented, Forestwise is well networked on both supply and demand sides, working with local communities and NGOs as well as buyers, such as Lush, who have aligned values.

M&E: With P4F support, Forestwise has put in place a system to track their illipe nut butter supply, demographic information on collectors, and payments. Through their close relationships with communities and NGOs, Forestwise is able to check whether the forest protection agreements are complied with.

Investment model: Forestwise raised over £1.3 million from the sale of illipe nut butter – to companies including Lush, IMCD, Alfa Chemicals Ltd. Tembawang and Premier – and £645,573 in private investment loans.

Market demand: While global demand for sustainable food and cosmetic products is growing faster than demand for conventional products, illipe nut butter has particularly high potential in the Indonesian market as the growing middle class demands more sustainable and local luxury products and companies are incentivised to look for local, sustainable and affordable alternatives to farmed and imported cocoa and shea butter.

Technological innovation: The project is working with communities to move away from a smoking process to soaking and sun-drying the nuts using a cold press machine. This reduces the health risk to community members and provides a consistently higher quality nut butter.

Support services: The illipe nut butter ecosystem is small and nascent, but Forestwise has leveraged support from financiers interested in sustainable and NTFP business models, including Otter Foundation and Beneficial Returns.

Portrait of Illipe nut farmers next to sun-dried Illipe nuts at a village in Sintang regency, West Kalimantan, Indonesia (Forestwise)

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Case Study
Ecoflora

What is the project about?

Ecoflora is a pioneer bio-based technology company that has developed and patented the world's first edible, safe, pH- and temperature-stable, naturally derived blue colourant: Jagua Blue. It comes from the Jagua (Genipa americana) – a native tree found in Colombia and many other South American countries – and can be used by the food, cosmetics, personal care and home care industries. It is the first Colombian product to be included in the Codex Alimentarius and completes the colour spectrum of naturally derived dyes for the first time, with safe blue colourants previously only available from synthetic substitutes. Ecoflora works with communities who collect the fruits in Colombia and produces and sells the colourant.

What transformational change was observed?

Ecoflora's business model is transformative for the food, cosmetics, personal care and home care industries, the communities collecting of the jagua fruits, and Colombia's forests and biodiversity. Jagua Blue provides global markets with access to all colours of the spectrum from natural sources for the first time. Communities that are collecting the jagua fruits are an integral part of Ecoflora's business model and are compensated fairly and supported through Payment for Environmental Services (PES) while they're planting and growing new jagua trees until fruits can be harvested and sold. The high value of the product significantly increases the value of the jagua trees and encourages reforestation and protection of biodiversity.

How did the causal pathway produce the outcome?

Mindset shift: The ten years of rigorous research required demonstrates the Ecoflora leadership team's strong commitment to the product and to SLU, and benefitted from support by public environmental agencies and municipalities where activities were taking place.

Sector-wide alignment: Ecoflora collaborates closely with regional environmental agencies (Cornare and Masbosques) that supported the

development of the new product and contributed to a PES scheme that supports communities to plant and grow jagua trees.

M&E: With Jagua Blue's development reliant on R&D, Ecoflora has always closely monitored its technical processes and business practices. They have members of staff dedicated to field visits, closely managing relationships with jagua-harvesting communities and spotting issues early on.

Investment model: Ecoflora has raised over £4.7 million in private investment.

Market demand: Before Jagua Blue, blue was the only colour which could not be derived from natural sources safely for human consumption. Demand for this is high among food, cosmetics, personal care and home care industries.

Technological innovation: Ecoflora holds two patents for the process and technology of producing the blue colourant. The product has been approved by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) – which determined that the colourant is safe for human consumption – and is in the final stages of gaining FDA approval.

Support services: Masbosques, a regional environmental body, has supported jagua growing through PES. Legal consultants have supported Ecoflora to obtain approvals for human consumption in different geographies.

Were there other factors that are not reflected in the QCA?

Investor engagement: Ecoflora's management team has closely managed relationships with investors, ensuring it understands and meets their needs and concerns.

Jagua cross section (Ecoflora)

Causal pathway 2: mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * support services

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Case Study
Lestari Capital

What is the project about?

P4F supported Lestari Capital, a market access player, to link conservation and restoration projects across Indonesia with global companies. This enables the companies to meet their net zero, deforestation-free and other sustainability commitments by investing in sustainable forestry and conservation projects, and provides forestry projects with payments for managing forests sustainably and resources to develop further sustainable income streams.

What transformational change was observed?

Lestari Capital's significant contribution is that, with its partners, it established a non-carbon PES market in Indonesia for the first time. The business model meets an important – and growing – market of companies looking to invest in sustainable projects to meet their environmental commitments and nature-positive agenda. The third-party certified outcomes from the projects allow the companies to ensure credible and verifiable impact, adhering to commitments such as Roundtable on Sustainable Palm Oil (RSPO) or Science Based Targets Network (SBTN), and communicate their efforts transparently. The sustainable forestry projects gain reliable 25-year funding cycles, rather than previously short-term philanthropic or public funding. The payments directly benefit the communities implementing the forestry projects, and allow them to invest in further community development. The model has been so successful that Lestari Capital is looking to expand to new geographies, including Malaysia, the Philippines and Papua New Guinea, to new markets, including rubber and fashion, and to new types of supply project, including conservation license holders and national parks.

How did the causal pathway produce the outcome?

Mindset shift: Lestari Capital's investment vehicle Rimba Collective was possible due to the commitment of its leadership team and the founding member companies. Since then, clients, including Unilever, have seen the value of the model and are looking to increase their investment and communicate more impact in their brands.

Sector-wide alignment: The business model provides verified outcomes that can be claimed towards sustainability commitments such as RSPO and SBTN. Early endorsement by RSPO helped legitimise the business model.

Governance innovation: Lestari Capital staff have served on a, RSPO working group, an SBTI Technical Advisory Group, and part of the Corporate Engagement Program of SBTN.

M&E: As part of their obligations and to make outcomes claimable by clients, Lestari Capital closely monitor the impact of the company and obtains third-party verification for all their supply projects.

Investment model: Seven companies have invested in the two current investment vehicles (Rimba Collective and SCCM), committing approximately £69m and protecting over 41 thousand hectares of forest.

Enabling policies: The business model has benefitted from several Indonesian regulations, including a multi-use license which allows the exploration of non-timber business ideas, such as PES, parts of the carbon regulation, and community-managed social forests. Lestari Capital is also looking to leverage pressure from importing countries such as the EU's Deforestation Regulation, net zero targets or other compliance regulations to strengthen the PES market in Indonesia.

Market demand: Globally, pressure on companies to sign up to and comply with voluntary commitments is growing and more sectors and markets are covered by their own specific commitments. Lestari Capital is leveraging this by expanding from working with palm oil and consumer goods to rubber and fashion companies.

Support services: Third-party certification bodies and collaboration with on-the-ground project developers and operators that act as the middlemen

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between forest communities and Lestari Capital have been crucial to the business model.

Were there other factors that are not reflected in the QCA?

Adaptable product offering: Lestari Capital's business model can be easily replicated and adapted for different sectors and markets.

Co-design with clients: Lestari Capital worked closely with its first clients (founding members of their investment vehicle Rimba Collective) to ensure the fit and usefulness of the business model to clients.

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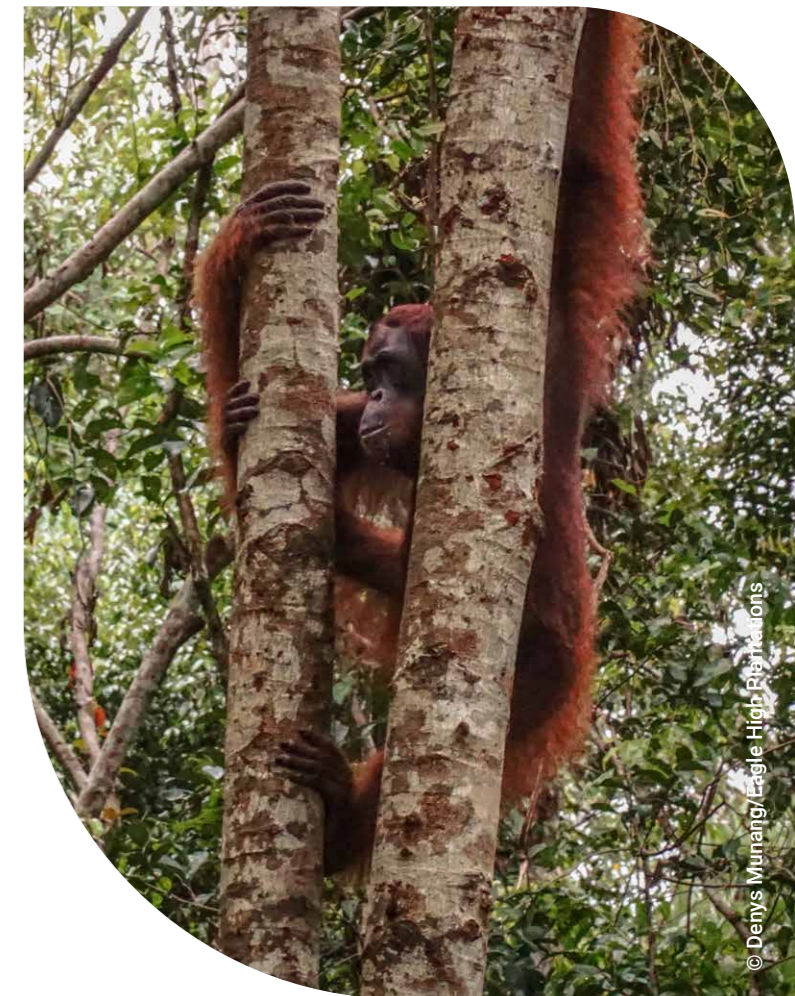
Causal pathway 3: mindset shift * sector-wide alignment * governance innovation * m&e * investment model * enabling policies * market demand * technological innovation * public economic incentives

Case Study
Ethiopian Wild Forest Coffee

What is the project about?

Ethiopian wild forest coffee has the potential to significantly enhance the protection of Ethiopia's old growth forests by unlocking the value of these areas and incentivising communities to work together to reduce encroachment. This has been made possible by P4F's Ethiopian Wild Coffee (EWC) project to raise the profile of Ethiopian forest coffee across the value chain. On the supply side, the project improved the quality and traceability of forest coffee – including processing and community engagement work – across the five producing areas. On the demand side, the project supported efforts to promote Ethiopian Forest Coffee as a global premium product and generate market traction with multiple coffee buyers and retailers. To create a conducive environment, the project worked to improve export rules with Ethiopian government institutions and with the Ethiopian Coffee and Tea Authority (ECTA), to inform their strategy and policy development specifically for forest and semi-forest coffees. In its second phase, the project made a concerted effort to hand capacity building and coordination activities over to private sector actors, so that the value chain actors continue the activities without the need for public or philanthropic funding.

What transformational change was observed?

The transformational change brought about by the project is that Ethiopian forest coffee, which used to be seen as low value, is now sold as a premium product globally. This was made possible by the project increasing the quantity, quality and market demand, supported by an improved enabling policy environment. The coffee sector benefits from increased investment due to increased confidence in the product. For example, ETCOF and Moyee Coffee have entered the landscape and have increased their investments. The coffee growing and harvesting communities benefit from increased income and capacity by selling premium, processed (i.e., roasted) products. The environment benefits from the preservation of Ethiopia's old growth forests, including the most important ecological gene library for coffee.

How did the causal pathway produce the outcome?

Mindset shift: While SLU and collaboration was at the heart of the project, private sector actors' mindset has also shifted and they are now driving the activities – including capacity building of communities and support services to the sector – and supporting organisations like P4F and GIZ can phase out support.

Sector-wide alignment: The first phase of the project invested in stakeholder engagement to create a common vision for Ethiopian forest coffee. Since then several new actors, including ETCOF and Moyee Coffee, have joined the market and carry on the vision.

Governance innovation: The project established and ran several Ethiopia Forest Coffee Forum meetings. The ongoing coffee forum organized by the Ethiopian Coffee Exporters Association also engages traders and government representatives.

M&E: As part of the project, B Agro is developing the Awakilo platform, which will provide online traceability, including information on every coffee farmer, capacity building and a helpline for coffee farmers, as well as serve as a trading platform that connects buyers to coffee farmers. It is maintained through a small user fee.

Investment model: EWC has raised over £17 million in revenue from sustainable coffee sales. This is set to increase as additional actors enter the market and make investments of their own.

Enabling policies: The project's close collaboration with Ethiopian authorities, notably the Ethiopian Coffee and Tea Authority, has secured buy-in to the value chain and involvement in activities, including Awakilo. The Government has recently changed regulations to make coffee exports easier for private, non-government exporters.

Market demand: Global coffee supply that complies with voluntary sustainability standards has increased from about 1 million tonnes in 2008 to 2-4 million tonnes in 2019, increasing its market share from around 11% to 21–45% in 2019 (Bermudez et al. 2022).

Technological innovation: The Awakilo platform serves as both an extensive traceability platform and a capacity support platform for coffee farmers and harvesters. It also includes a support hotline for coffee farmers to directly contact extension workers.

Public economic incentives: Coffee exports are exempt from VAT, which is 15% for other commodities.

Conclusions for P4F's strategy

All ten factors appear at least once across the three pathways to success and each successful case scored 1 against at least seven out of ten factors. This indicates that a large set of factors need to be in place for a project to contribute to transformational change, in line with the observations in Table 4. The factor that stands out in the analysis is, of course, *Investment model*. It is the parsimonious solution and part of each pathway of the intermediate solution, and its absence is the most common solution in the negative analysis of *not* contributing to transformational change. This is very much in line with P4F's theory of change, which is built around incubating business models that attract investment into SLU.

Interestingly, the negative analysis (see Table 6) also seems to confirm P4F's theory of change. It indicates that a supportive and enabling business environment – with the right policies, incentives and support structures – is necessary for the FPs to thrive, which aligns with P4F's funding of Enabling Conditions (see Figure 1). The absence of *Enabling policies* and *Public economic incentives* both feature as part of the intermediate solution of the negative analysis and show a relatively high difference in prevalence between successful and unsuccessful cases (*Enabling policies* are prevalent in 90% of successful versus 40% of unsuccessful cases, and *Public economic* incentives are prevalent in 60% of successful versus 10% of unsuccessful cases).

A further observation is that although *Mindset shift*, *Sector-wide alignment*, *M&E*, and *Market demand* were present in all successful cases and all pathways of the intermediate solution, *Sector-wide alignment* and *Market demand* were also present in 80% of unsuccessful cases, and only *Mindset shift* featured as part of a pathway of the intermediate solution of the negative analysis.

This suggests that key factors for FPs to contribute to transformational change are:

- *Investment model*;
- *Enabling policies*;
- *Public economic incentives*;
- *Mindset shift*.

In general, the analysis confirms the Transformative Change Framework and factors developed by the evaluation managers and P4F's theory of change in that FPs need to be investable to be transformative, rely on a supportive policy environment and key stakeholders need to be committed to SLU.

This suggests that creating an environment conducive for transformational change – via close collaboration with investors to understand their concerns and requirements and engagement and support to policy makers – should be a priority for any P4F follow-up programme or similar programmes.

Ethiopian Wild Coffee processing

© P4F

Reflections on using QCA

One of the objectives of conducting this QCA was to trial this methodology for use in programmes similar to P4F, seeking to deliver transformational change and having results indicators that capture numbers and descriptions of cases of change as an output results level.

The following reflections offer guidance on if and when QCA is appropriate and issues to keep in mind when considering using QCA in a learning context.

In which circumstances might QCA be the right choice?

A strength of QCA is identifying patterns in complex situations and understanding why an outcome happens in some situations but not others. This means it is most suitable for situations in which many different factors may contribute to an outcome but the number of cases is too low for statistical analysis. It is best used with ten to 50 cases and between ten and 20 factors. Because it is relatively work intensive, especially in the preparatory phase, it should be used for questions that are a) central to programme design, and b) relevant to the programme theory of change or key programme level learning questions (identified during the initial programme design and planning phase and reviewed periodically during implementation).

What are potential drawbacks?

QCA is time intensive, especially if the team needs to understand and learn the methodology, process and software first. While there is an increasing amount of guidance available, it is still a new methodology and has little support for questions not covered by written guides. This means that QCA is best used for limited but central questions. However, this may cause a timing challenge. On the one hand, if the findings of the QCA are to feed back into a programme's strategy, it would be best to conduct a QCA relatively early in a programme and perhaps on an ongoing basis. On the other hand, conducting a QCA requires data from sufficient cases which definitively have or have not reached the outcome in question, which may require the programme to have

run for a period of time. This was especially true for the outcome of contributing to transformational change explored in this QCA. A QCA may therefore be most suitable for quickly materialising outcomes, programmes of significant duration or programmes with follow-up phases, or where the findings will be of interest to the wider field.

What is the required effort and resources?

Several QCA software options (including fsQCA) are free to download and use and there are free scholarly articles with guidance. However, due to its relative complexity, a consultant was hired to provide guidance and support for this QCA. To do the QCA well, time and diligence needs to be put into identifying the appropriate factors, establishing clear definitions for outcomes and factors, including the positive or negative prevalence of a factor, and for case selection and scoring. As QCA is a largely iterative process, it can be beneficial for the work to be done by a small team. Running the QCA software is quite fast once the software is understood, but the discussion of results can also take time and is best done in a small team.

Tips for the process:

While it is entirely possible to develop a framework of factors to score cases on, it can be helpful to use an existing and generally accepted framework for the outcome in question, such as the Transformative Change Framework used in this report or the ICF KPI 15 criteria. Either way, it's crucial to have a well-developed definition of the outcome (e.g. 'contributing to transformational change') and the factors, including definitions of '0' and '1'.

Recommendations:

QCA is probably most suitable for the analysis of a few complex, central questions and to test important assumptions in a programme's theory of change. QCA might be useful to answer those strategic learning questions, where it is possible to use the findings

Members of Community Resource Management Board (CREMA) for the Juaboso District (Touton)

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to change course if needed. QCA may also help to test a framework of criteria for a certain outcome, as in the finding in this analysis that, generally, most factors included in the Transformative Change Framework need to be present for an FP to contribute to transformational change.

For a programme like P4F, for example, a follow-on programme that has a similar theory of change – built around FPs, enabling conditions and demand-side measures – QCA could be used to analyse:

- **What factors can create an enabling environment to unlock investments into a SLU economy that benefits both nature and people?** This question could explore different aspects of enabling conditions such as economic incentives for SLU practices, technical support, public one-stop shops for setting up a new business, suitable finance and investment tools, training and education for a skilled workforce, and multi-stakeholder collaboration. The findings could be used as a checklist to identify which types of enabling conditions may need to be strengthened in a geography or sector.

- **What types of demand-side measure are most effective in supporting an enhanced market for sustainably sourced products?** While there are more and more commitments made, not all are followed through. This question could explore which factors are most likely to support the implementation of existing corporate supply-chain commitments, existing public procurement policies and the development of new responsible sourcing guidelines and implementation tools. The findings could be used for developing impactful demand-side measure projects that are designed in a realistic and effective way.

- **How can a SLU business model best support social impact, especially on gender, equality, and diversity?** P4F-supported FPs were designed to be economically and environmentally sustainable, but social impact has become increasingly important during the programme implementation. In a follow-up programme, social impact, especially for vulnerable groups, is likely to have a bigger focus. Exploring this question would first require the assessment of social impact delivered by different FPs, before exploring which aspects of an FP that have supported that social impact.

- **What factors are required for a business model to be replicated or scaled?** To bring about impact at scale, it is important to trial different SLU business models and to replicate and scale successful ones. The answer to this question could help to quickly identify businesses that have the potential to be scaled or replicated, and so to focus limited resources on those FPs that are likely to have the biggest impact.

- **Which combinations of factors lead to the uptake of learning products by investors to increase investments in SLU?** Investors are a key stakeholder in the success of P4F and a follow-up programme of increasing investments into SLU are a goal of the programme. As investments into SLU are still relatively few and far between, especially at scale, learning products and information targeting investors' concerns could help overcome some of the barriers. The findings of this question could help with ensuring those products are designed and delivered in an effective way.

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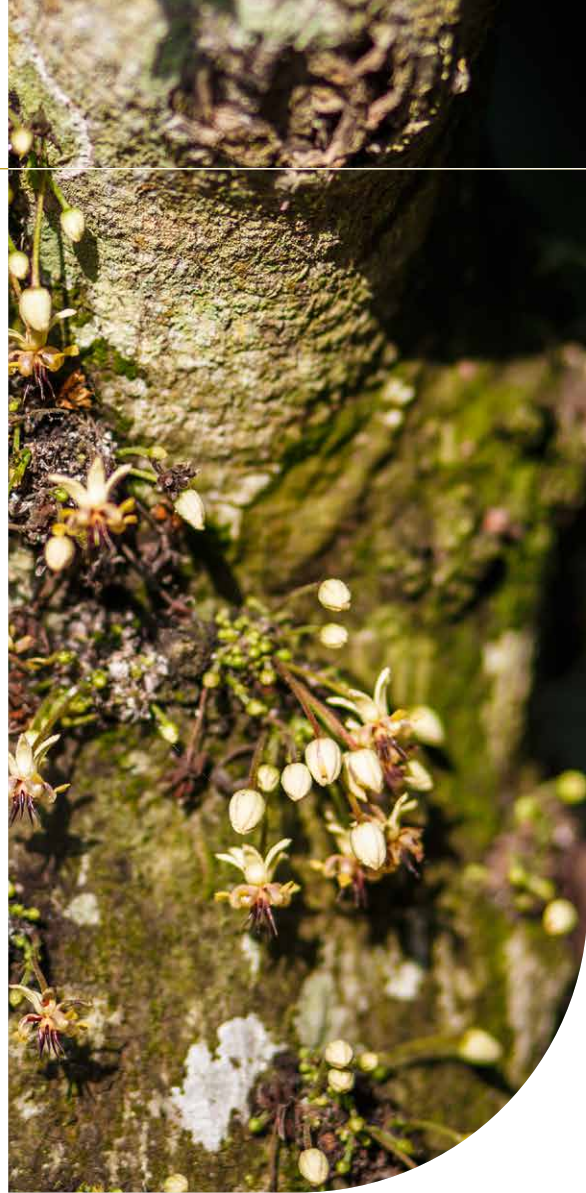
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