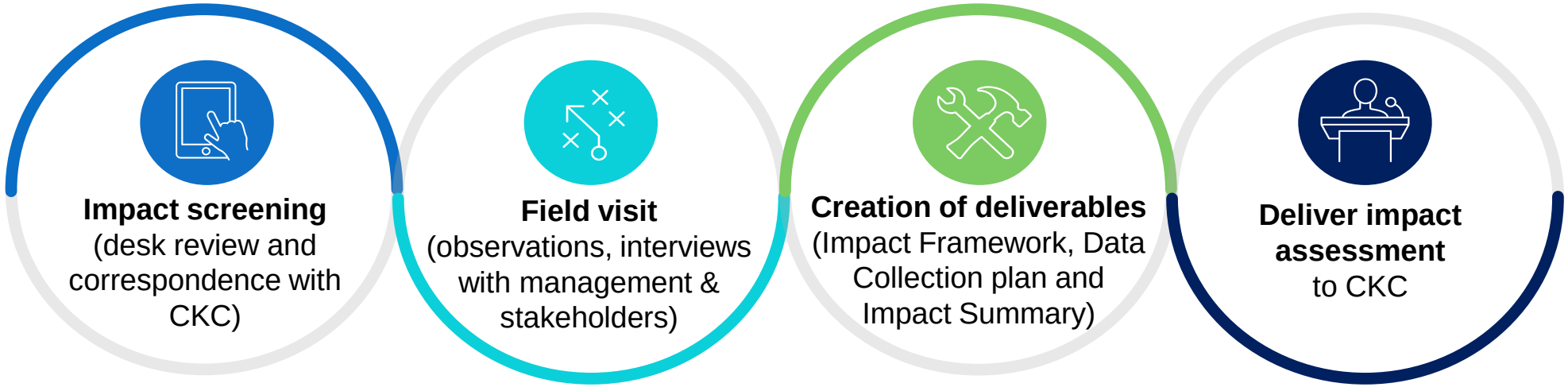
Coconut Knowledge Center (CKC)

Impact Summary

Jun 2018

Impact Assessment Approach

Third-party Impact Assessment conducted by IIX, a Singapore-based Impact Enterprise providing impact assessment services which enable impact enterprises and inclusive businesses to monitor, quantify and communicate the social-environmental impact which they create.



Engagement of key stakeholders through **onsite interviews** (5-8 Feb 2018) **:**

- ✓ Micro-entrepreneurs (MEs) – VCO production facilities set up by local entrepreneurs who get the technical support from CKC
- ✓ ME employees – Full-time employees at the micro-enterprises, hired from the local communities; approximately 65% of ME employees are women
- ✓ Customers – Downstream MSMEs who procure VCO from the MEs
- ✓ Partner farmer – Farmer who supplies coconuts to the ME
- ✓ Management team members
- ✓ Environment

The Context

The global demand for coconut and its related products had grown five times in the past decade. With health-conscious consumers driving up the demand for coconut products, the global virgin coconut oil market accounted for USD 2.1 billion in 2016, it is anticipated to double to USD 4.2 billion by 2024.[1]

Indonesia is one of the world's largest producers of coconuts (18 million metric tons of coconuts in 2014[2]) with the highest area (3.6 million hectares in 2015) under coconut cultivation, accounting for over 30% of the 11 million hectares under cultivation globally.[3]

In Indonesia, 98% of the coconut farms are managed by small farmers. Despite the growing demand for coconut products globally, most coconut farm communities remain relatively poor.

Coconut production in Indonesia has consistently declined in the past decade (5.6% to 3 million tons in 2014) mainly due to aging coconut plants, pest and diseases.[2] Without external intervention, smallholder farmers struggle to improve yield.

Source:

1. *http://www.srilankabusiness.com/blog/growth-of-global-demand-for-coconut.html*
2. *https://www.bloomberg.com/news/articles/2017-07-31/water-milk-or-shampoo-coconut-versatility-stokes-planting-boom*
3. *http://www.iosrjournals.org/iosr-jhss/papers/Vol.%2022%20Issue9/Version-12/E2209124756.pdf*

The Problem

In the face of a highly fragmented value chain in coconut, the farming communities in Indonesia are clearly not capturing a sufficient share of the profit in the supply chain. Some reasons behind the situation include:

- **Limited and low value products**
  The farming communities generally engage in low value products such as copra, with production on a small scale where the resultant oil is normally of low quality.[1]

- **Lack of market access**
  High cost of logistics due to small production lots and high transport costs impede smallholder farmers from accessing high value-added market chains. Further, their products often do not comply with the prevailing technical standards.

- **Complex supply chain structure with various middlemen**
  The coconut value chain is predominantly unorganized, impeding economies of scale. The local small farmers are often exploited, giving away substantial margins to intermediaries who do not commit to stable contracts.

Source:
1. *http://www.kokonutpacific.com.au/the-copra-problem-dme-solution*

CKC's Solution

CKC provides patented technology, equipment, training packages to micro-entrepreneurs to set up virgin coconut oil (VCO) production facilities within the coconut farming communities, giving them the opportunity to participate access high value agricultural value chain. CKC offers a 5-step process to establishing the value chain interventions.

1. Set up facilities

CKC identifies local partners (micro-enterprises) who are interested to set up VCO production faculties.

Workers are hired from the local communities near the factory, as well as from the coconut farmers.

2. Coconut Procurement

The production faculties are strategically located to be surrounded by coconut farming communities to ensure freshness from minimal transport and easy access to farmers.

3. Production

CKC adopts the proprietary Direct Micro Expelling (DME) systems in the production process which produce virgin coconut oil under an inclusive business model to a market ready standard, suitable for immediate domestic consumption or export.

4. Market Access

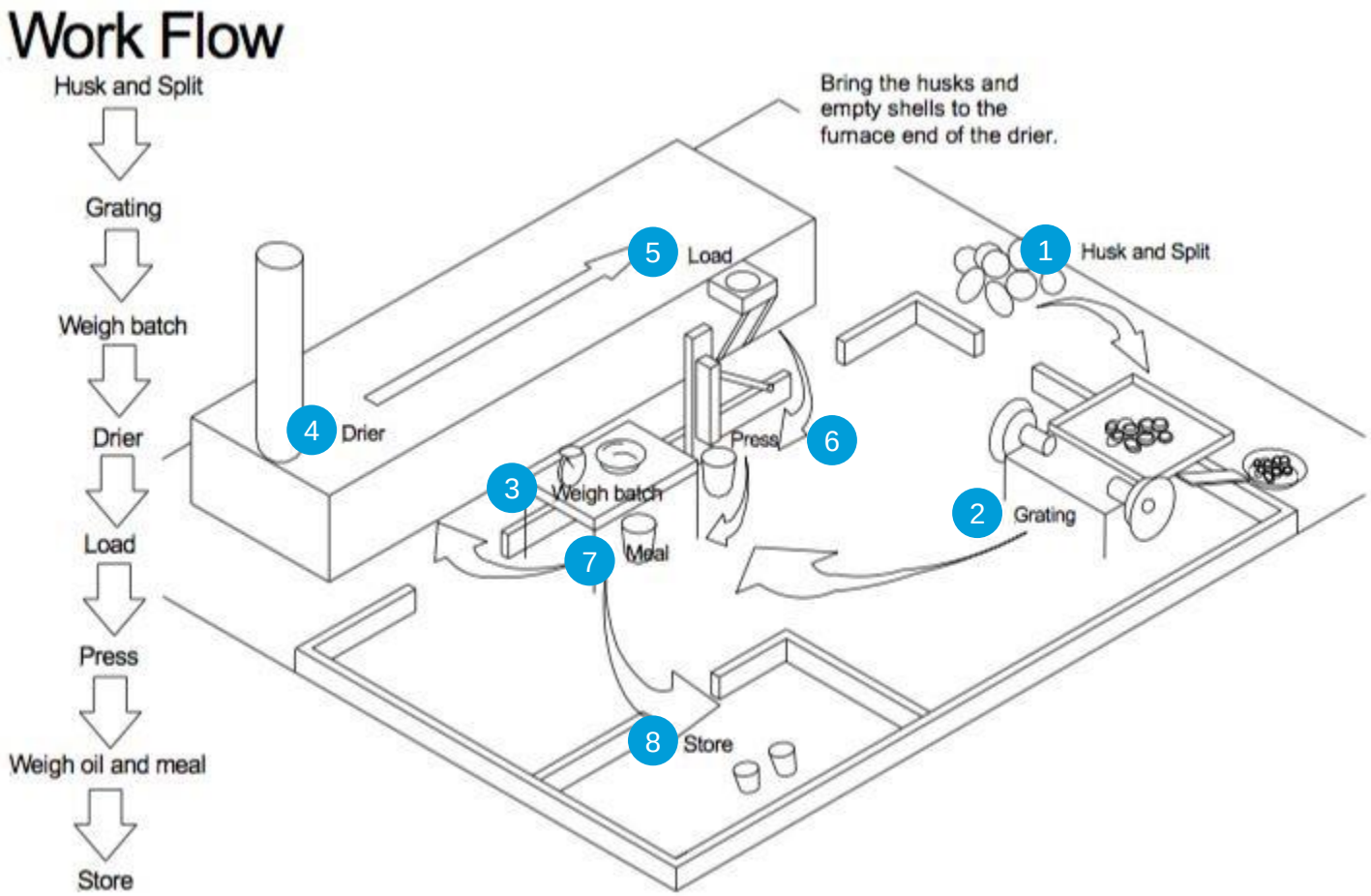
CKC brands and sell VCO and related products to local customers (e.g. retailers, supermarkets, restaurants), and also offers access to export markets.

5. Replicate Model

CKC continues identifying local partners in other locations. New partners receive training and technical know-how both from CKC and the micro-factories that have been set up previously.

DME Production Model

The Direct Micro Expelling (DME) System adopted by CKC has been successfully established in Pacific islands. The system was invented to implement coconut production in rural farming communities to create opportunity for smallholder farmers.



Key Features of a DME System

- Minimal initial investment on equipment (~ USD 10k), with no need for large machinery, fuel, or other production materials
- Lead time of 12 weeks from site review to construction of a micro factory
- Each factory can be operated by 9 persons at full scale
- Manually operated cold-pressing unit produces raw oil from fresh coconuts within an hour, ensuring the freshest oil
- Residues form the production process are converted to animal feed stock.

Impact Overview – Primary Outcomes

CKC is a triple bottom line company, creating environmental and social returns alongside financial returns.

INCREASED ACCESS TO KNOWLEDGE & EQUIPMENT

Stakeholder: MEs

By having access to the proprietary DME kit, local micro-entrepreneurs are able to set up VCO production facilities with minimal initial investment and manpower.

INCREASED INCOME

Stakeholder: ME employees, Women, Farmers

The majority of the employees (65%) at the micro-factories are women. By offering higher wages, employees at the MEs experience an increase in regular income.

By procuring coconuts from small scale farmers at a premium, farmers are now able to receive higher and predictable income.

AVOIDED CARBON EMISSIONS

Stakeholder: Environment

CKC's system adopts a zero-waste production process. Coconut shell is used as a fuel in DME flat-bed type conduction dryers to dry grated coconut kernel prior to oil extraction.

This replaces the need for grid electricity substantially, hence reducing carbon emissions.

IMPROVED HEALTH

Stakeholder: Consumers

The consumption and use of VCO boasts of multiple health benefits, including improving cognition for people developing or already with memory impairment, such as Alzheimer's disease.

Selected Impact Indicators

Output metrics

- *Number of micro-entrepreneurs (MEs)*
- *Number of coconuts purchased from farmers*
- *Number of liters of VCO sold*

Outcome metrics

MEs

- Increase in access to knowledge and skills CKC's DME kits

ME employees

- Increase in income with formal employment at the MEs

Famers

- Increase in income from selling coconuts directly to MEs at market premium

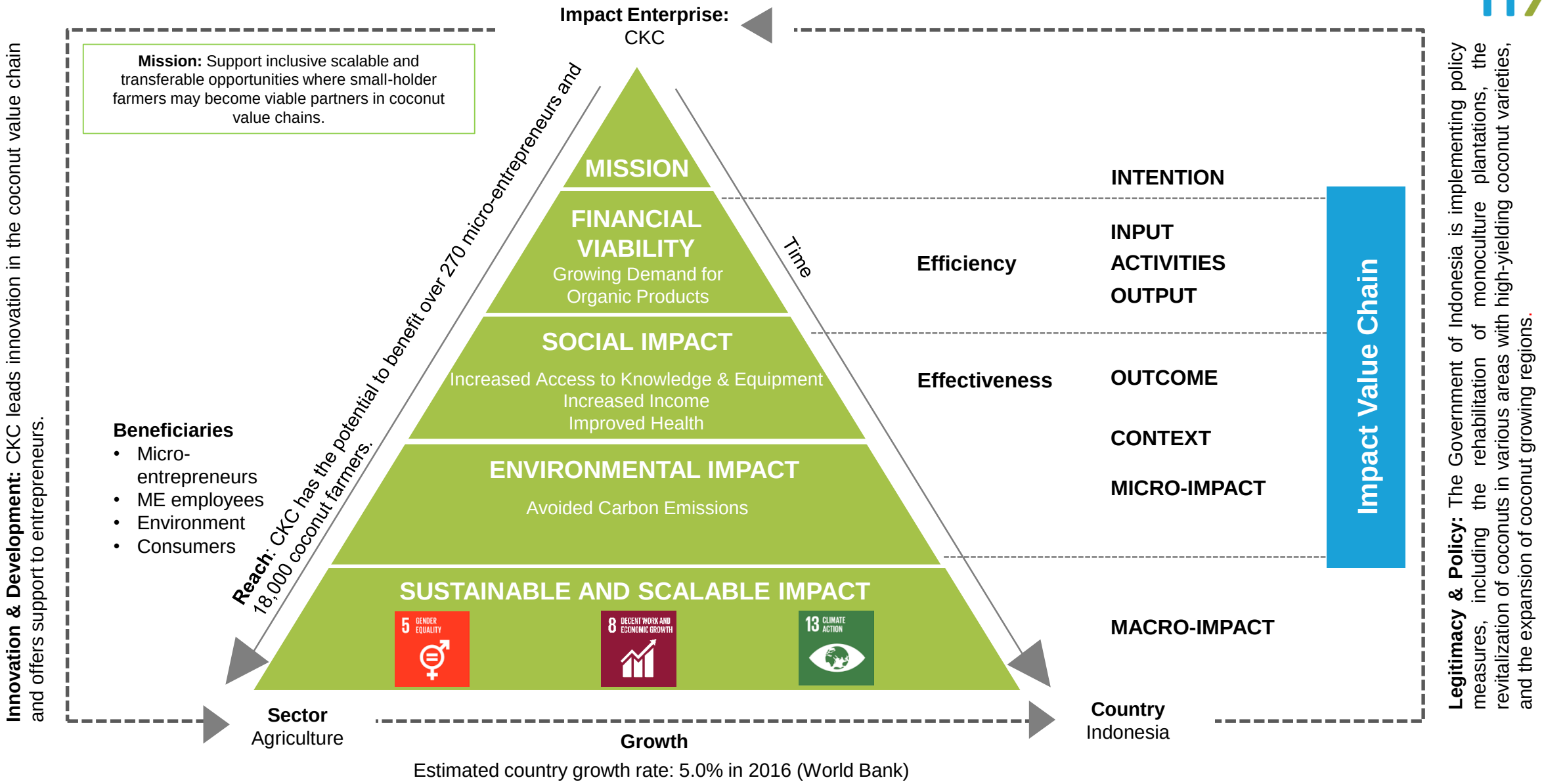
Environment

- Metric tons of CO_2 emissions by utilizing coconut biomass for heating

Consumers

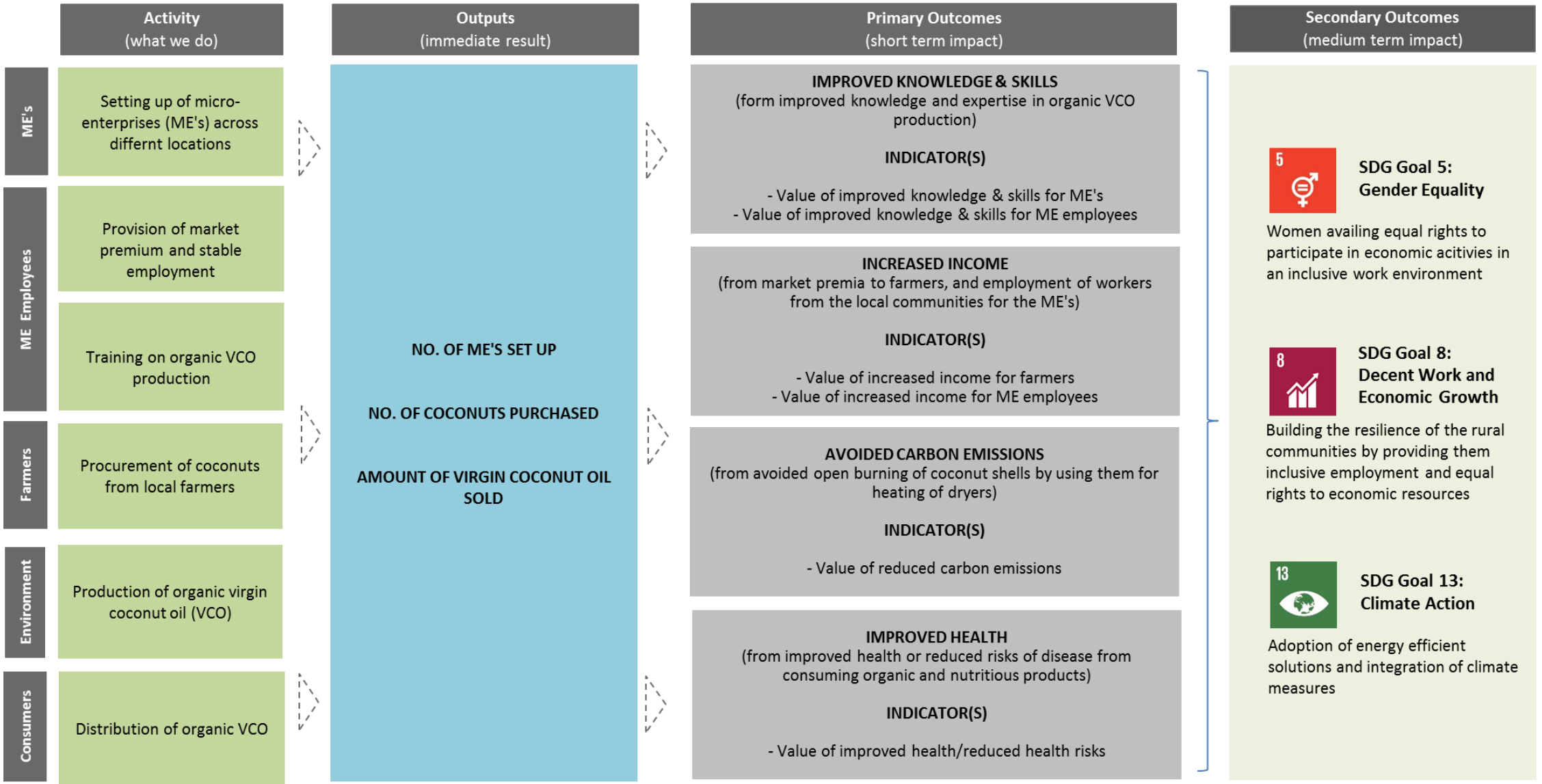
- Improved health from consumption of VCO

IIX Sustainability Pyramid



Estimated country growth rate: 5.0% in 2016 (World Bank)

CKC's Impact Value Chain



Impact Projections

Stakeholder: Micro-entrepreneurs

Through CKC's offering of the DME kit, **270** micro-entrepreneurs will experience increased access to knowledge and equipment worth **USD 2,411,014.**

Stakeholder: ME Employees, Women

Over **4,000** ME employees (including **2,600 women**[1]) hired from local communities will experience increased income worth **USD 243,174.**

Stakeholder: Farmers, Women

Over **18,900** coconut farmers (including **9,400 women**[2]) will be able to sell their coconuts at market premium directly to the micro-factories without having to sell to traders. The resultant increase in stable income worth **USD 1,460,620.**

Stakeholder: Environment

By using coconut shells for heating the dryers, over **54,000** MWh of grid energy will be replaced, saving over **57,000** metric tons of carbon emissions, valued at **USD 782,979**

Stakeholder: Consumers

Over **8 million** consumers will benefit from improved health valued at **USD 3,795,391** from the consumption of virgin coconut oil.

* Assumptions: 1) 65% of ME employees are women based on observation from the field visit. 2) 50% of coconut farmers are expected to be women.

Driving the Sustainable Development Goals

CKC is a triple bottom line company, creating environmental and social returns alongside financial returns.

Goal 5: Gender Equality

CKC advocates for an inclusive work environment with women having equal rights to participate in economic activities.

The majority of the employees (65%) at the micro-factories are women. They are involved in most of the VCO production process. Some of the women are even involved during the construction stage of the factories.

In addition, with a stable work environment, women are empowered to provide for their children and families.

Goal 5: Decent Work & Economic Growth

Workers hired from the local marginalized communities are now offered an inclusive work environment with increased financial security, reducing youth unemployment. The workers indicated significant improvement in their quality of life.

By introducing innovative production technologies, CKC enables farmers and the local communities to participate in the high-value market chains.

Goal 13: Climate Action

CKC's zero-waste approach to production reduces contribution to carbon emissions. In addition, by improving the economic viability of existing coconut farms, smallholder farmers partnering with MEs may reduce deforestation (driven primarily by high input monocrops like palm oil).

CKC is actively exploring into a Whole Nut and Intercropping model which may further promote sustainable agriculture value chain.

Social Return On Investment (SROI)

SROI (USD)	FY2018	FY2019	FY2020	FY2021	Total
Present value of net impact					
Outcome 1. Improved knowledge and skills	335,034	497,681	709,714	868,585	**2,411,014**
Outcome 2. Increased income	180,723	309,938	504,926	708,207	**1,703,794**
2a. for ME employees	11,823	33,954	72,004	125,392	243,174
2b. for smallholder farmers	168,900	275,984	432,921	582,815	1,460,620
Outcome 3: Avoided carbon emissions	93,620	151,133	234,079	304,146	**782,979**
Outcome 4: Improved health	438,883	717,138	1,124,937	1,514,433	**3,795,391**
Total Present Value (PV) of Net Impact					**8,693,177**
Input: Investment Capital to be raised					**2,000,000**
Net Present Value (NPV)					**6,693,177**
SROI (using NPV)					**3.35**

Key Assumptions	Outcome	Unit	FY2018	FY2019	FY2020	FY2021	Total
Micro-enterprises (MEs)	1	#	30	50	80	110	**270**
ME Employees experiencing increase income - cumulative	2a	#	270	870	2,070	4,050	**4,050**
Smallholder farmers - cumulative	2b	#	1,500	4,500	10,100	18,900	**18,900**
Coconuts purchased	2b	# in MM	5	10	17	26	**59**
CO2 avoided from using grid electricity	3	tCO2e	3,406	6,244	10,989	16,621	**37,259**
VCO Consumers	4	#	810,000	1,485,000	2,613,600	3,953,070	**8,861,670**

Discount rate: 16.13% - Average of CKC's Weighted Average Cost of Capital (WACC*) and US Risk-free Lending Rate

Calculating the SROI

To calculate the gross value for each outcome, IIX attaches financial proxies to estimate the impact experienced by each beneficiary group. IIX discounts the gross value for deadweight, attribution and displacement to arrive at the net value for each outcome.

Outcome	Stakeholder	Financial Value
Increased access to knowledge and equipment	Micro-enterprises	• Amount of cost reduction through CKC's DME kit, compared against comparable product packages available in the market.
Increased income	ME employees Coconut farmers	• ME employees - Average increase in wages offered by the MEs per employee • Coconut farmers – Average market premium paid per coconut; Profit that would have otherwise been paid to traders
Avoided carbon emissions	Environment	• Social cost per ton of CO_2 emission avoided from using grid energy
Improved health	Consumers	• The state of hygiene and health status are quantified by the disability-adjusted life years (DALYs) per 100,000 people for the incidence of diarrhoea

CKC Summary

Year of Incorporation: 2014
Country of Operation: Indonesia
Impact Assessment Conducted by: IIX

ORGANIZATION MISSION

Support inclusive scalable and transferable opportunities where small-holder farmers may become viable partners in coconut value chains.

IMPACT SUMMARY

Social Return on Investment for **USD 2,000,000** capital raise for domestic market expansion is **'3.35**' (USD 3.35 of impact created for every USD 1 raised).
CKC achieves the following overarching outcomes:

1. **Increased Access to Knowledge & Equipment**
   Stakeholder: Micro-entrepreneurs
2. **Increased Income**
   Stakeholder: ME employees, Farmers
3. **Avoided Carbon Emissions**
   Stakeholder: Environment
4. **Improved Health**
   Stakeholder: Consumers

Recommendations

IIX recommends CKC undertake the following actions to grow demand for its products/services and magnify its impact:

Current Situation	Recommendation	Anticipated Changes
• Coconut farmers are locked down by forward contracts with the traders to sell large quantity of coconuts at low prices post-harvest. However, the quantity remains small due to the lack of scale. As a result, the farmers are still not able to reduce their reliance on traders to sell.	• To increase impact of the rural coconut farming communities, CKC should consider offering an option to procure coconuts from farmers in larger quantities. • This could include working with the MEs in increasing the production capacity, improving market access.	• With large and consistent order commitments, farmers will be in a better position to negotiate pricing and reduce their exposure to unfair contracts and payments from the traders. As such, farmers will experience an increased sense of empowerment, and long-term financial resilience.
• The number of people employed by the MEs at a village level is limited by the scale of production. As a result, the MEs have to be very selective in the hiring process.	• Besides scaling up the production quickly, CKC is in the process of developing 'whole-nut' processing. Continuing this effort could help in the production of high-value coconut products at the village level.	• With 'whole-nut' processing, more people can be directly employed from the local communities. In addition, the inclusion and diversification of high value products will directly improve rural productivity.

CKC's Projected Impact

Selected Impact Indicators from CKC:

37,000 metric tons of CO_2 avoided

12,000 women* impacted

23,000 people from local communities impacted

IIX **expedites global climate action**

IIX redefines the narrative to position **women as solutions**

IIX **builds resilient communities**

* Assumptions: 1) 65% of ME employees are women based on observation from the field visit. 2) 50% of coconut farmers are expected to be women.

Impact Investment Exchange (IIX) builds inclusive markets by **mobilizing capital for social and environmental solutions**, with the mission to **impact over 65 million lives** by 2022. IIX has driven the United Nations Sustainable Development Goals (SDGs) forward through its three-pronged agenda:

THANK YOU

ধন্যবাদ, Terima kasih, 谢谢, Danke, धन्यवाद, Salamat, ขอบคุณ, Cảm ơn, ありがとう, អរគុណ, Cè-zù tin-ba-deh, 감사합니다, Dank u wel, آپ کا شکریہ, 多謝, Gracias, ಧನ್ಯವಾದ, Obrigado, تشکر , Grazie, Merci, شکرا , Kia Ora, ຂອບໃຈ, Dankie, நன்றி