Conservation Investment Blueprint: Smallholder Forestry Vehicle - Kilifi, Kenya

By Komaza, January 2020

i. Overview of the conservation need/opportunity

The Conservation Need

In Africa, 65% of land is affected by degradation and three million hectares of forest are lost annually[1]. Many countries in Africa, including Kenya, have lost over 80-90% of their tree cover in the last 40 years. East Africa's coastline, home to remnant coastal forests and one of the continent's most biologically diverse areas with several endangered and vulnerable species, is under severe pressure from deforestation and degradation. This issue is also contributing to a significant proportion of the continent's greenhouse gas emissions and is increasing the vulnerability of communities to drought, flood, and other effects of climate change.

Wood consumption is Africa's leading cause of forest degradation. At the same time, as African economies grow and urbanize, demand for domestic industrial wood products continues to rise and is expected to increase by an estimated 5-7% annually[2]. New forest plantations are difficult and costly to establish due to competition with the agricultural sector for land and there is high potential for conflict over land use rights[3]. Without increases in domestic wood production, the continent will need to rely on imports and further exploitation of natural forests to meet its needs.

With stagnant supply and booming demand, Kenya's wood deficit will grow 300% by 2030, to 35 million cubic meters[4]. Most of Kenya's fuel wood comes from unsustainable harvesting of the country's 2 million hectares of dry woodlands. For example, supplying the deficit estimated for the year 2030 alone would require clear-felling over 700,000 hectares of dry woodlands, equivalent to 35% of Kenya's resource. At this rate every single dryland tree in the country would be consumed within three years, resulting in the destruction of ecosystems in some of the world's most important biodiversity hotspots.

Komaza is currently operating in areas across coastal Kenya, including deforested and degraded areas near boundaries of the Arabuko Sokoke Forest that stretches along the coast from southern Somalia, down through Kenya, Tanzania, and most of Mozambique. At 420 square kilometres, the Arabuko Sokoke Forest is the largest remaining piece of the coastal indigenous dry forests of Eastern Africa. The forest consists of three ecosystems: mixed forest, Brachystegia (tropical timber) forest and Gynometra forest. The Arabuko is a designated Unesco Biosphere Reserve and is believed to contain titanium and oil deposits. The threat of mining along with illegal logging, poaching, land grabbing, and human encroachment have place increased pressure on the forest[5]. The costal mangrove forests that adjoin the Arabuko also face deforestation pressure as communities in this area rely on wood from coastal mangrove forests for craft, housing, furniture and local construction.

Despite decades of deforestation and degradation, the Arabuko is a remarkably bio-diverse ecosystem containing 270 species of bird, 261 butterflies, 79 reptiles and amphibians, 52 mammals and 600 plants species. It is an area of high endemism and is home to many endangered species, including four mammals and six birds, as well as a number of vulnerable species including the African savannah elephant[6]. Less than 10% of the original ecosystem remains and is disappearing fast. The coastal forests of East Africa surrounding the Arabuko are also of high biodiversity value and are experiencing the same pressures.

[1] http://afr100.org/content/afr100-overview
[2] http://www.criterionafrica.com/wp-content/uploads/2017/06/Allocating-Capital-for-Maximum-Impact-in-the-Africa-Forestry-Sector.pdf
[3] https://energypedia.info/images/f/fe/Forest_Plantation_in_Sub_Saharan_Africa.pdf
[4] http://www.komaza.com/environment
[5] https://www.theguardian.com/society/2012/feb/21/arabuko-sokoke-kenya-forest-conservation
[6] https://www.edgeofexistence.org/blog/a-conservation-success-story-for-arabuko-sokoke-forest/

The Arabuko Sokoke Forest is protected as a national Forest Reserve, which means that it has been surveyed, demarcated and gazetted and is managed by the national government Forest Department. The local community, under the Arabuko Sokoke Forest Adjacent Dwellers Association (Asfada), comprising 152,000 members from 52 villages, is also contributing to ongoing conservation efforts in collaboration with the Kenya Forest Service and Kenya Wildlife Service. However, due to poor farming conditions, increasing populations, and booming demand for fuel wood, Arabuko trees are being cleared, degraded habitat is desertifying, and many species are increasingly threatened by extinction.

Komaza believes that smallholder forestry presents a critical opportunity to meet the twin challenges of increasing un-met demand for domestic wood consumption and the threat of deforestation and degradation of important biodiversity ecosystems. Smallholder forestry can restore unused, degraded portions of smallholder farming plots and at less than 20% of the cost of traditional plantations, it can also provide climate resilient long-term savings and diversification to farmers. Komaza has developed plans for a first "proof of concept" Smallholder Forestry Vehicle (the Vehicle) which seeks to raise US$ 35 million to purchase 5,000 hectares of unused, marginal land to plant trees. Once the concept is proven, the Company will seek to launch follow-on Vehicles every 3-5 years, each around US$ 50-100 million in size and covering 7,000-15,000 hectares of planting.

The Vehicle will enhance climate resilience and biodiversity benefits through two primary routes: first, the Vehicle will increase ecosystem adaptation through the restoration of degraded land. Planting trees creates shade from the hot sun, boosts soil water retention, rebuilds topsoil from leaf litter (and sometimes nitrogen-fixing roots), and provides much-needed habitat for many species of birds, reptiles, mammals and insects. Kenya's National Adaptation Plan outlines twenty adaptation actions and sub-actions, seven of which the Vehicle addresses directly or indirectly. In addition to helping reduce local temperatures and absorb water from flooding, land restoration improves soil quality, water retention, and increases wildlife habitat[7]. The land restoration impacts also closely align with Sustainable Development Goal 15, "Life on Land," which focuses on land degradation and sustainable forest management.

The Vehicle will also improve socioeconomic resilience by helping smallholder farmers absorb the shocks of climate events. The Global Innovation Lab for Climate Finance (the Lab), which is a network that aims to accelerates well-designed financial instruments and scale up both public and private climate finance, conducted an investment analysis of the Vehicle[8]. The Lab's modelled results show that the proof of concept facility will reach over 16,000 farming households and provide additional income of over US$ 1,200 per household, with these numbers increasing to 50,000 households and nearly US$ 1,500 per household, respectively, for the full-scale follow-on SPV.

ii. Describing how the Blueprint contributes to conservation goals

Overall statement

This Blueprint contributes to the conservation and enhancement of forest ecosystem biodiversity by reducing extractive pressure on natural forest resources. This is achieved through Komaza's Smallholder Forestry Vehicle which packages tree production partnership contracts with thousands of smallholder farmers and sells them to investors, providing farmers and forestry companies with access to low-cost, long-term finance while enabling institutional investors to access sustainable forestry investments.

The proof of concept activities focused on areas across coastal Kenya from Malindi to the Tanzania border will finance the restoration of 5,000 hectares of degraded farmland and provide more than 16,000 farmer households in Kenya with increased climate resilience and over US$ 1,200 of savings each year. It aims to create sustainable livelihoods which provide increased incomes to smallholder farmers, while reducing pressures on existing forest ecosystems and restoring degraded ecosystems.

At scale, each Smallholder Forestry Vehicle could restore 15,000 hectares of degraded land, engaging 50,000 farming households and achieving a modelled 15-17% gross internal rate of return. Smallholder farmers accumulate wealth similarly to a savings plan, by maintaining trees and receiving payments at thinning and harvest. By providing less-climate dependent income and crop diversification, the partnership thus reinforces farmers' climate resilience and the resilience of forest ecosystems.

[7] http://www4.unfccc.int/nap/Documents%20NAP/Kenya_NAP_Final.pdf
[8] https://www.climatefinancelab.org/project/harvest-contract-vehicle/

The Vehicle supports the conservation of biodiversity and reduction of land degradation by producing fast-growing non-native commercial species for construction, poles, furniture, charcoal etc., which reduces extractive pressure on native dry woodland across Kenya and mangrove forest in coastal areas for similar products. It also provides an alternative source of livelihood for communities living near natural forest areas, reducing pressure from small-scale charcoal production, fuelwood collection and agriculture expansion. Moreover, where indigenous species are included in the species mix (though this is limited) this helps restore soil and provides habitat for native species.

Identifying key metrics

Key outcome indicators to measure progress against the conservation goal are:

- Number of farmers employed to grow trees (disaggregated by gender and "bottom of the pyramid" person status)
- Komaza tree farms planted
- Trees planted cumulatively
- Hectares of land under cultivation
- Reduction of deforestation (in particular loss of mangroves)
- Average farmer income generated (cumulatively and over distinct periods)
- Income from tree harvest ($)
- # farmers trained in sustainable forestry and silvicultural practices (total farmer partners)

iii. The business model

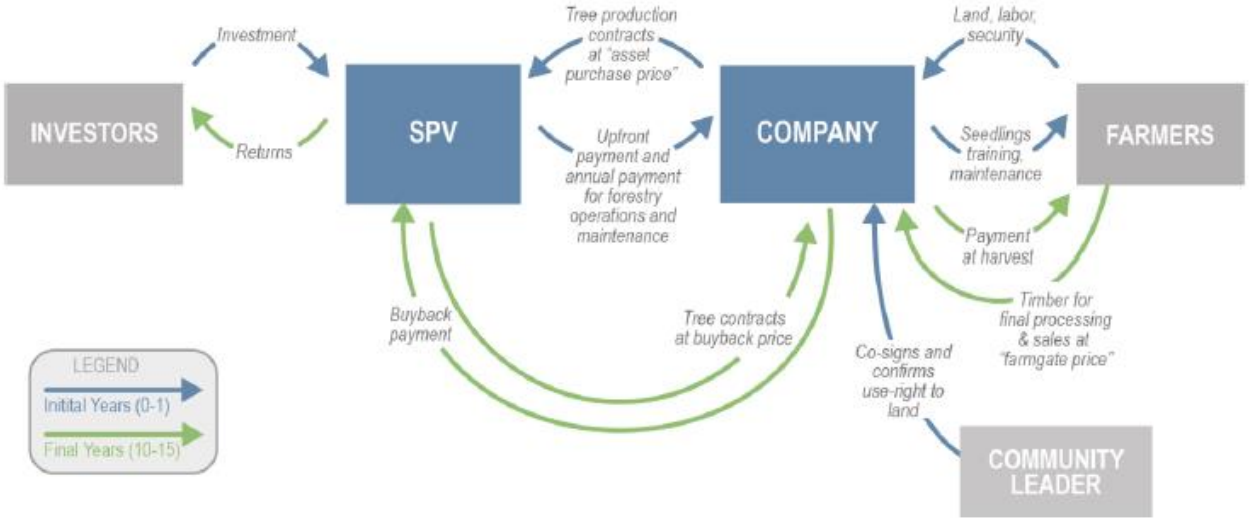
Organisation and governance

The typical lifecycle of a greenfield forestry investment includes three distinct stages, each carrying different risks:

1. Establishment: This stage includes securing land, seedling procurement (including nursery operations), and planting. Contrary to a typical plantation investment, smallholder forestry entails low upfront costs, as land use is compensated either through rent or payments at harvest. This is the riskiest stage of a tree's life, as trees have the highest mortality rates for the first 12-18 months from planting.
2. Growth: The bulk of the lifecycle is for the biological growth of the trees, which varies by tree species and environmental conditions, and lasts a minimum of 7-8 years for the fastest growing species. The risks during this period are primarily tree mortality events, such as disease and fire, as well as slow tree growth.
3. Harvest: Once trees reach maturity, they are harvested, processed, and sold to end customers. The biggest risks in this phase relate to the ability of the company that owns the trees to cost-efficiently harvest, transport, and process the trees, as well as market volatility in demand and prices.

Komaza's Smallholder Forestry Vehicle proposes to make smallholder forestry in Africa commercially viable by separating the risks of the longest, yet least risky growth stage, from the risks of the establishment and harvest stages, thereby reducing the overall cost of capital. It will do so by establishing a Special Purpose Vehicle (SPV) that will purchase young tree assets from an operating company (the "Company" i.e. Komaza) that originates tree production contracts with smallholder farmers, and then will sell back the tree contracts to the Company prior to harvest (see Figure 1).

Figure 1: The Smallholder Forestry Vehicle Instrument mechanics[9]



Prior to planting, the Company will work with farmers and their communities to assess land suitability and secure land use rights for tree growing. The land consists of unused, degraded portions of smallholder plots. Once enrolled, farmers contribute land and labour, and are paid a market price for harvested trees. The Company provides training, planting inputs, maintenance support, harvesting services, and a guaranteed market for the trees.

The Company sells a portfolio of tree production contracts to an SPV after approximately one year of tree growth (after the highest tree mortality period), in exchange for an upfront payment that compensates the Company for its initial investments in the tree production (e.g., nursery, planting, and recruitment of farmers). Each SPV portfolio will comprise 1-3 vintage years of tree contracts. The SPV will be financed by debt and equity investors. The proceeds from investors will finance the maintenance of the trees until harvest as well as enable the Company to scale its operations and plant more trees sooner than without the investment. Cash flows are driven by the tree vintages included in the SPV, thinning regime, and harvesting cycles.

The SPV contracts with the Company for the ongoing maintenance of the trees. In addition, to improve tree growth rates, the Company will thin out and sell weaker trees periodically (e.g., once every 3-4 years), creating revenue for both farmers and the SPV. Other impact-related revenues could also be sought to increase interim cash flows, such as the monetization of climate adaptation benefits.

The SPV will be a closed-end vehicle with a duration of 12 years, with possible extension of 2-3 years. The SPV is managed by an Issuer, which will be the Company or its affiliate. The SPV will require a separate accounting system, and the tree assets will be valued by an independent evaluator to determine a fair transfer price. The SPV will also need to pay for independent audits and secure a back-up servicer in case the Company fails prior to the end of the Vehicle term.

The Company will buy back the tree production contracts prior to final harvest using short-term working capital, at a fair price calculated with valuation methods agreed at initial investment. The Company will retain a flexible, three-year window during which to buy back the contracts, either through a single purchase or in several instalments to smooth capital needs. The Company is then responsible for harvest, farmer compensation, transport, processing, and final market sales.

Farmer compensation is set by a transparent algorithm that establishes a minimum compensation price, but rewards farmers for better-than-expected tree growth and market prices. In this way, smallholder farmers accumulate wealth similarly to a savings plan, by maintaining tree assets and receiving payments at thinning and harvest. The partnership also helps farmers in semi-arid regions diversify their crop portfolio. By providing non-climate dependent income and diversification, the partnership thus reinforces farmers' climate resilience.

The SPV is under development by Komaza, a smallholder forestry company in Kenya with more than 10 years' experience in partnering with 20,000 smallholder farmers, over half of whom are female, to plant and

[9] https://www.climatefinancelab.org/wp-content/uploads/2018/02/Smallholder-Foresty-Vehicle_Instrument-Analysis.pdf

harvest 5,000 hectares of trees. Komaza has already made important steps towards launch, including securing support from The Nature Conservancy for early-concept development and a grant from Partnerships for Forests to fund technical due diligence activities, and being shortlisted in the Green Climate Fund's global request for proposals for a guarantee, concessional debt, and a technical assistance grant. The Company has also begun to compile information on potential arrangers and legal firms.

Products and services being sold

The Smallholder Forestry Vehicle fills a crucial gap in Africa, where extremely limited investment is occurring in forestry. Investments in the forestry sectors in Latin America and Asia are 8-10 times higher than in Africa, with plantation establishment investment essentially negligible in Africa and highly reliant on development finance institutions[10]. While a small number of out-grower schemes are financed by large corporations and publicly funded extension schemes, no other investment approach focuses on scaling smallholder forestry through innovative finance.

The Vehicle improves results through a strong cooperation model between an operating company and farmers. While smallholder forestry is more cost effective than greenfield and brownfield plantation investments, smallholder forestry schemes often fail because they are not developed in cooperation with businesses that provide access to harvesting, transport, value-added processing equipment, technical know-how, and market access, resulting in lower productivity and poorer product quality[11][12]. The Vehicle is based on such a cooperative model.

The tree species purchased by these funds will be Eucalyptus Grandis Camaldulensis and the Kenyan native species, Melia Volkensii, the species currently planted by Komaza. Komaza expects that a large portion of the final timber products will be wood products such as Chromated copper arsenate (CCA) treated construction poles and sawn timber sold into the domestic market. Revenues are generated at thinning in year 3 and 4, when thinned trees are sold as 5-7-inch poles and residues are sold for use as sustainable charcoal, and at final sale of tree contracts to the Company (years 3, 11 and 12). Finally, the SPV could include one small portfolio of earlier vintage of trees (e.g., 8- year old trees) to help prove the concept sooner than the full tree growth cycle. The SPV will be registered in Kenya.

Setting up the first SPV can take up to 12-18 months, to implement accounting and monitoring systems, conduct technical due diligence including finalizing the Vehicle's structure, and setup the legal arrangements for the first time. However, follow-on vehicles will be easier to set up, and can reduce the timeline to about six months.

Cash flows and commercial sustainability

The Lab's financial modelling outputs rely on discounted cash flow modelling of the unit economics and the SPV. The unit economics model tested how underlying timber prices, harvest outcomes, and costs affect unit returns and the SPV model simulates how different financing scenarios and sensitivities impact returns and distribute losses. The unit economics assumptions were provided by the proponents, and the assumptions on SPV costs were collected via interviews and literature.

The unit economics model examined cash flow patterns, cost drivers, and financial sensitivities. Specifically, the following inputs were considered:

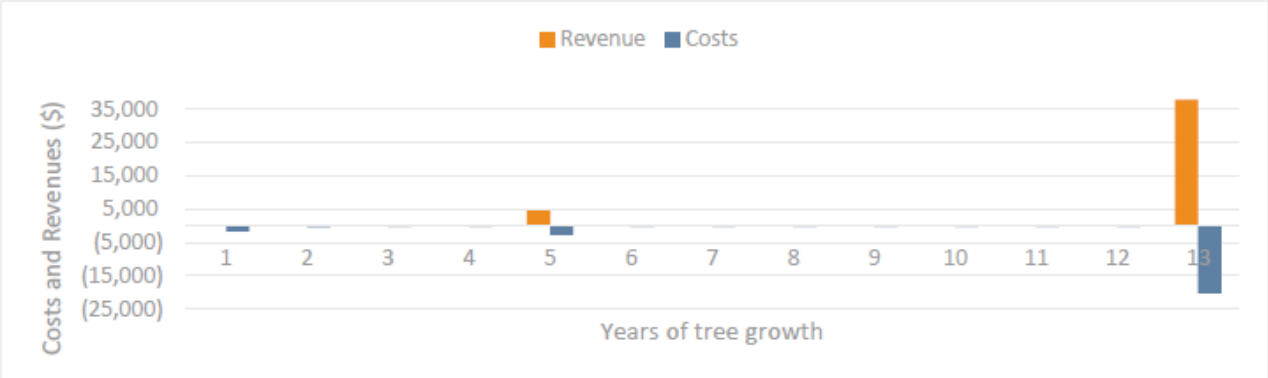
- Market price for timber
- Planting cost
- Forestry operation and maintenance cost
- Harvesting cost
- Farmer income
- Wood processing costs
- Sales cost
- Tree growth per hectare

[10] http://www.criterionafrica.com/wp-content/uploads/2017/06/Allocating-Capital-for-Maximum-Impact-in-the-Africa-Forestry-Sector.pdf
[11] https://energypedia.info/images/f/fe/Forest_Plantation_in_Sub_Saharan_Africa.pdf
[12] Maurice J., Le Crom M., Bouyer O., Pesce F., Cielo P., Gachanja M., Bull L. (2017). Improving Efficiency in Forestry Operations and Forest Product Processing in Kenya: A Viable REDD+ Policy and Measure

- Thinning trees
- Tree survival rate
- 12-year period

The analysis found that most costs are generated during year 12 when the bulk of the trees are harvested and relate to harvest and processing costs and payment to farmers. This is also when most of the revenues are generated. There are also some of these costs and revenues in year 4, but they are comparatively small (see Figure 2).

Figure 2: Unit economic cash flow



For the proof of concept facility, the analysis considered a $35 million SPV with an annual management cost of US$100,000. The SPV is made up of a 60% debt tranche and a 40% equity tranche. The debt tranche receives interest on debt provided, with average interest targeted at 6% (Table 1). The 12-year Proof of Concept Facility has three vintages: (1) 10-year old trees that are harvested and sold around year 3, (2) 2-year old trees that are sold back to the originating company in year 11, and (3) 1-year old trees that are sold back in year 12. Revenues are generated at thinning in year 3 and 4 and at final sale of tree contracts to the Company (years 3, 11 and 12). The proceeds from the first thinning and sale are kept in the SPV to cover costs in the following years. The older vintage is taken into the SPV to improve IRR and to enable proof of concept before the full lifetime of the SPV.

For the full-scale SPV, the analysis considered a $105 million SPV with an annual management cost of US$100,000. The full-scale SPV is also made up of a 60% debt tranche and a 40% equity tranche. The debt tranche receives interest on debt provided, with average interest targeted at 8% which is a move towards more commercial debt cost (Table 1). The 12-year full-scale SPV has two vintages: 1-year old and 2-year old trees that are sold back to the originating company in years 11 and 12. The other factors are as in the Proof of Concept Facility.

Table 1 below provides the assumptions the Lab used to model the base case scenario for the Proof of Concept Facility and the full-scale SPV. The base case scenario inputs related to the timber business specifically were provided by the proponent, are based on in-depth analysis of their historical and expected costs and revenues and reflect a conservative scenario.

Table 1: Model assumption for the base case scenarios

Assumption	Value: Proof of Concept Facility	Value: Full-Scale SPV	Comments
Hectares	5,000	15,000	
Timber growth/ hectare	122 cubic meters	139 cubic meters	Tested in sensitivity analysis.
Buyback price/cubic meter	$100/ cubic meter	$110/cubic meter	Tested in sensitivity analysis. The buyback price is set based on certain product breakdown assumptions and can vary according to the product mix strategy as well as quality/size/vintage of trees harvested.
Total cost of trees over SPV lifetime	$5,400/ hectare	$4,900/ hectare	
SPV lifetime	12 years	12 years	Based on expected tree growth.
SPV Setup costs	$0.8m	$0.8m	
SPV management costs (p.a.)	$0.1m	$0.1m	
Leverage	60%	60%	
Debt interest rate	6%	8%	Tested in sensitivity analysis.
Impact Assumptions			
Payment to farmer per cubic meter	$35	$35	The farmer compensation will be determined by contract based on the market price, which Komaza expects to vary between USD 20 and 40/CBM according to the quality of trees.
Average farm plot size	0.3 hectare	0.3 hectare	

Based on the planned Proof of Concept SPV structure and the assumptions outlined in Table 1, the proof of concept achieves a fund gross IRR of 11.1% and an equity IRR of 11.4% in the central (base case) scenario. Based on the planned Full-Scale SPV structure and the assumptions outlined in Table 1, the SPV achieves a gross IRR off 17% and an equity IRR of 18.5% in the central (base case) scenario. Farmer income would reach $73 million, supporting 50,000 farmers with US$1,469 each. This would increase average farmer income from trees by 15% compared to the Proof of Concept Facility.

The distribution of profit and the risk-return characteristics of each actor will be established in lasting power of attorney (LPA) or SPV legal documents. Debt financing will receive coupon payments and equity financing will receive any upside in financial performance. Komaza, as the operating company, will receive management fees to pay for operational costs and may potentially receive a success fee once passing a hurdle rate (a minimum rate of return set by the investor). Ongoing decisions around the securitization of assets and distribution of profits among the small holder farmers, investors and Komaza will be made to ensure long term sustainability.

External dependencies

Prior to planting, the Company will work with farmers and their communities to assess land suitability and secure land use rights for tree growing. Neither Komaza nor the Smallholder Forestry Vehicle model relies on any particular policy context to facilitate its operation. However, a rigorous legal and political environment is

recognised as being supportive and the general trend toward environmental protection and sustainable forestry management by the Kenyan government has provided positive momentum for Komaza.

Komaza has valued partnerships and alliances with organisations such as The Nature Conservancy (TNC), Gatsby Foundation, Mulago Foundation and Conservation International. While these have served to improve Komaza's operations and provide key resources, Komaza is not significantly dependent on any of these organisations.

Risk management

The Smallholder Forestry Vehicle reduces transaction costs for investors and reduces some risks of plantation forestry. Because investments in individual smallholder plots are typically too small compared to the due diligence costs required for direct investment[13], the Vehicle instead permits individual investors to invest in an aggregated vehicle. This approach also allows diversification across a wider geographic area than a single plantation, reducing the risk of fire, disease and land conflicts that can occur in plantation forestry.

By segregating the risks of the individual tree assets from those of the Company, the Vehicle can achieve a lower cost of capital while attracting a broader diversity of investors to participate, than the Company could achieve through traditional balance sheet finance. This is especially important as there is little low-cost financing available at the long maturities needed for forestry in Kenya and other developing countries[14]. In addition, the lack of sufficient financial track record in most early-stage businesses is a significant barrier to investors[15][16][17].

By purchasing the Company's least risky assets (e.g., trees after 1-2 years of growth), the Vehicle can be a lower-risk investment than the Company itself, which may be of particular interest to long-term investors, such as pension funds that are typically more risk averse and seeking to match their long-term liabilities with their assets. As a less risky investment, the Vehicle could also benefit from a lower cost of capital than the Company itself, though this would depend on transaction costs and risk mitigation.

To attract private investment at scale, the Vehicle will have to demonstrate that the risks it does carry – notably tree growth and operating company risks – can either be reduced or effectively mitigated. Table 2 describes these risks and accompanying management.

Table 2: Challenges to instrument success and suitable management strategies

Challenge	Description	Management Strategy
Tree Growth Risk	Risks that trees do not reach targeted growth due to, e.g., fire, disease, and side-selling.	The Vehicle's proponent has developed the following strategy to align farmer incentives with high tree growth: 1) good contract design; 2) community leader involvement and approval of land use; 3) a strong economic value proposition; and 4) technical assistance. Other risk mitigation strategies could include purchasing fire insurance and over-collateralizing the SPV by including extra trees.

[13] http://assets.rockefellerfoundation.org/app/uploads/20160121144045/conservation-finance-en.pdf

[14] http://siteresources.worldbank.org/EXTENERGY2/Resources/SREP_financing_instruments_sk_clean2_FINAL_FOR_PRINTING.pdf

[15][15] https://www.forumforthefuture.org/sites/default/files/project/downloads/forestinvestmentreviewfull.pdf

[16] http://assets.rockefellerfoundation.org/app/uploads/20160121144045/conservation-finance-en.pdf

[17] http://www.klgates.com/files/Publication/fc458161-9277-43e1-9f7d-7af9ccc81097/Presentation/PublicationAttachment/28f2cba4-f279-4fd8-be9f-80ee51ca5fe5/Financier_Worldwide_Feb_2013.pdf

Operating Company Risk	Risk that the Company is not able to buy back the trees at a fair price	The Vehicle's proponent is focused on maturing their business, for which it is raising corporate finance separately. The development agency guarantee, and first loss equity will help mitigate these risks in the first SPV. The Company will also need to identify a back-up servicer for the SPV to step in, in case of bankruptcy. While the Company and investors will play the central role in coordinating the investment vehicle, it is also important to protect the interests of farmers. In the actual term negotiations, the Company and investors will agree on clauses to protect the rights and benefits of farmers in the case of default. Furthermore, it may also be an option for impact-oriented investors to decrease their share of economic returns to increase farmer payment.

In terms of environmental and social safeguards, Komaza is compliant with the Kenyan government's environmental certificates and audit requirements and is currently applying for FSC Certification for higher level forestry management. Operationally, Komaza has thousands of pages regarding standardized procedures to ensure proper planting and forestry management practices. Komaza has worked with TNC, Gatsby Foundation and Conservation International to continue to improve it environmental and social impact.

As part of ongoing risk management practises, Komaza has also maintained close partnerships with local and national level government agencies. At the local level, Chiefs (local representative of the President Office) are playing key roles in validating Komaza's farmer contracts, while local branches of Kenya Forestry Service (KFS) and Kenya Forestry Research Institute (KEFRI) are providing technical assistance to promote sustainable smallholder forestry. Komaza also has organization-level strategic partnerships with the two agencies KFS and KEFRI.

iv. The investment model

The financial instruments being sought to fund the business model

For the first SPV, the "proof of concept facility", investors will be offered several options for investment. The Smallholder Forestry Vehicle's structure allows a broad array of private and public investors to participate according to their risk appetites and impact orientation. In addition, a strategic corporate investor – such as a multinational forest products buyer – will also be targeted, which will help demonstrate a path to market for the final products. Following the proof of concept, SPV size as well as debt and equity returns will increase, thus attracting larger, commercial investors, such as pension funds and commercial banks.

The relative size of these instruments and basic information on their terms

For the proof of concept facility, a 12-year vehicle financed by 60% debt and 40% equity was modelled. As a central scenario, a 6% average interest rate for debt and a buyback price that is ~30% greater than estimated costs was assumed. Some cash flows prior to buyback are generated through thinning in the fourth year as well as the inclusion of a small share of older trees in the facility that are sold in year 3. Based on these assumptions, the facility achieves a gross internal rate of return (IRR) of 11.1% and an equity IRR of 11.4%.

The proof of concept facility seeks to raise US$ 35 million to purchase 5,000 hectares of trees, including US$ 21 million in commercial debt, concessional debt, and repayable grants, backed by a full principal guarantee, and US$ 14 million in equity financing comprised of both senior and junior equity. In addition, the Proponents seek US$ 800,000 to fund the SPV set-up costs. The Proponent considers the first SPV to be the

highest risk, given the Company's early stage and the nascent domestic timber market. The approximate payback period for loans would be 15 years which is the life of the fund, though this may vary depending on the asset vintage mix which drives cash flows. The cost of debt will largely drive the returns on equity, which could be around 15-20% in the case of highly concessional debt or 10-15% with less concessional debt.

Once the concept is proven, the Company will seek to launch follow-on vehicles every 3-5 years, each around US$ 50-100 million in size and covering 7,000-15,000 hectares of planting at a time. Future SPVs will seek to minimize the need for concessional capital and increase returns as tree growth and unit production costs improve over time, risks are reduced, and a track record is established.

For the follow on SPV, a SPV of US$ 105 million with 15,000 hectares planted was analysed, which shows a 17% gross IRR for the SPV, with an 18.5% equity IRR for investors. The analysis assumed 16% higher tree growth, 10% lower costs, 10% higher buyback price for investors, and an 8% interest rate on debt. Public finance in the form of a guarantee would likely still be required to achieve the lower interest rate in the near term.

Investor types and the finance they provide at different stages of project maturity

The diagram below shows the investor types and the types of finance they provide for the programme

Table 3: Investment types in the proof of concept facility

Investment Type	Description	Targeted Investors
Debt	Senior debt to target ~8-12% interest rate	Institutional investors especially family offices, Conservation, agriculture, and forestry investors, Impact-oriented funds, Development finance institutions
	Concessional debt or repayable grants to target 0-4% interest rate	Donor agencies, Program related investments
Equity	Mezzanine to target higher risk and returns	Family offices, Conservation, agriculture, and forestry investors, private equity, Impact-oriented funds, Strategic corporate investor
	First-loss equity for demonstration	Concessional donors, Operating Company
Guarantee	Guarantee on debt principal to achieve lower interest rate and demonstration effect	Development agency

Risk mitigation instruments used and how these were incorporated into the investment structure

The most significant sensitivities to returns of the facility are tree growth rates, the buyback price of trees paid by the Company, as well as the cost of debt. Concessional debt and/or repayable grants, and a guarantee for senior debt providers is needed to achieve an average cost of debt of 6% to prove the concept. Commercial debt offered by Kenyan banks is shorter term and averages 16%, which does not allow for equity returns for the central scenario of the proof of concept facility[18]. The proponent intends to secure a full principal public

[18] https://tradingeconomics.com/kenya/bank-lending-rate

finance guarantee for the proof of concept facility (see table 4 for a comparison of a business as usual funding scenario via corporate finance to financing via the proposed financing structure of the instrument).

Table 4: Funding scenarios

Type	Scenario A: No public capital	Scenario B: Public capital used to decrease risk for private investors
Senior tranche (debt)	60 % at 10% coupon	60% at 6% coupon
Guarantees		Guarantee protects senior principal
Mezzanine tranche (equity)	40% company equity	20%
Junior tranche (equity)		20% First loss equity

A first loss equity tranche will also protect downside risk from low tree growth and a lower-than expected buyback price. In the central scenario, tree growth can be 23% less than expected, and equity investors will still be able to recover their initial investment. A first loss equity tranche of 50% of total equity would protect other investors from up to 57% lower than-expected tree growth. Equity investors without a first loss tranche recover their initial investment at a buyback price 25% lower than the central scenario, while a first loss equity tranche of 50% of total equity protects senior equity investors down to a buyback price 35% lower than expected.

Agricultural insurance can also be purchased to protect investors from events such as fire. Over-collateralizing the SPV by including extra trees is another potential risk mitigation strategy proposed by the proponent.

The exit strategy employed

The Smallholder Forestry Vehicle will phase out public finance over time as risks become better known, especially as the Proponent company matures and the Vehicle establishes a track record. At scale, the Vehicle could have strong appeal for mainstream investors, including institutional investors. However, the phase out will be relatively slow, due to the long-time horizons required for forestry.

The Smallholder Forestry Vehicle is set up as a close-ended fund and the fund life (for each vehicle) will be defined when each vehicle is established to attract Limited Partners. At the end of the fund life, the Vehicle will distribute all the dividends according to LPA before dissolving. Each vehicle will create unique socio-environmental impacts through planting millions of trees with many thousands of farmers, bringing direct cash income to rural economies. In terms of ongoing conservation benefits beyond the life of the fund, while the fund itself provides "one-off" investment to Komaza's planting, the social (income) and climate (tree planting) impact will remain.

Innovative features of the investment model

The Smallholder Forestry Vehicle is unique by its focus on scaling up smallholder forestry investment and would represent one of the only vehicles for forestry investment in all of Africa, potentially transforming the forestry sector.

The Lab analyst team examined 36 different financing vehicles in agriculture, energy, forestry, and microfinance, including funds, bonds, securitizations, and corporate-financed out-grower schemes and found that the Vehicle fills a crucial gap in Africa, where extremely limited investment is occurring in forestry[19]. Of the forestry financing vehicles the Lab reviewed, there was only one other vehicle serving Africa, the Africa Sustainable Forestry Fund managed by Criterion Africa Partners, a private equity fund focused mostly on brownfield investment in existing plantations and downstream processing companies.

The innovate features of the investment model include:

[19] https://www.climatefinancelab.org/wp-content/uploads/2018/02/Smallholder-Foresty-Vehicle_Instrument-Analysis.pdf

- The strong cooperation model between an operating company and farmers that improves results.
- Reduced transaction costs for investors and reduced risks of plantation forestry (i.e. fire, disease, land conflicts) through aggregation across a wider geographic area than a single plantation.
- Lower cost of capital and increased attractiveness to a broader diversity of investors due to the segregation of the risks of the individual tree assets from those of the Company resulting in the vehicle being a lower-risk investment than the Company.

Replicability and Scalability

The instrument will first be deployed in coastal Kenya in Kilifi and Kwale counties, the site of the Proponent's current operations and one of the poorest rural regions in Kenya[20]. The frequency and severity of droughts in East Africa, and Kenya specifically, as well as the intensity of extreme precipitation and flooding, are expected to increase. The Proponent's current operations are located in an area of high vulnerability to climate change.

Following the successful implementation of the proof of concept facility, the Company will seek to launch follow-on vehicles every 3-5 years, each around US$ 50-100 million in size and covering 7,000-15,000 hectares of planting at a time. The Proponent plans to increase operations in Kenya, and is also considering expanding into neighbouring markets, including Ethiopia, Mozambique, Rwanda, Tanzania, and Uganda. Kenya alone has targeted the restoration of 5.1 million hectares of land by 2030, with 1.8 million hectares identified as suitable for farm forestry[21].

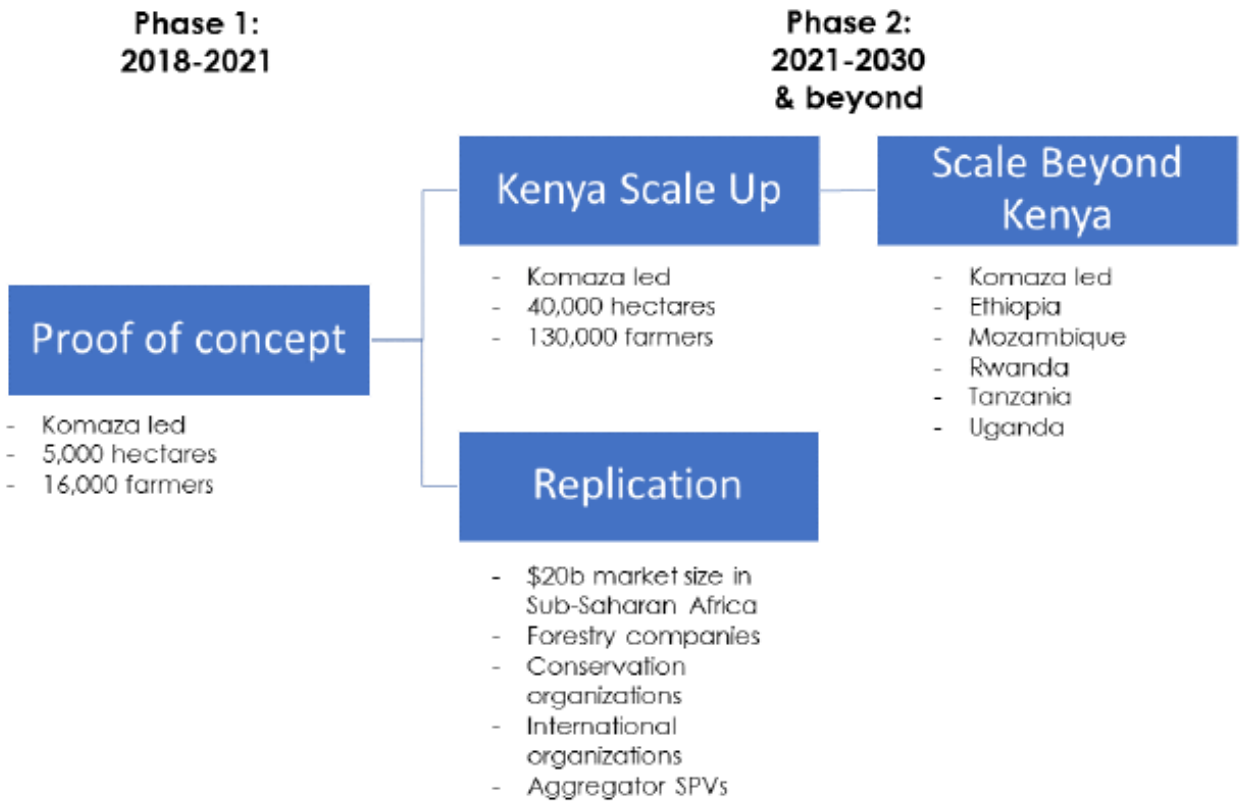
The Vehicle has the potential to mobilize private finance through direct mobilization, replication, and scale. Assuming the proof of concept facility leverages US$ 11 million concessional debt, US$ 7 million first loss equity, and a credit guarantee, to raise US$ 17 million of commercial capital, this represents a ratio of ~1:1 commercial to concessional capital. The Vehicle, in turn, will re-finance an initial US$ 12.5 million of private financing for establishment, and leverage US$ 100 million of private capital for final harvest, processing, and sales. Therefore, within the lifecycle of the hectares in the proof of concept facility, concessional financing will leverage more than six times the commercial financing.

A 2008 survey across Kenya indicated that 75% of marginal land is unused, with the highest proportions in the Central region (100%) and Coastal region (93.3%)[22], indicating a high potential to scale the Vehicle. Assuming a new SPV is deployed every three years, and each new vehicle includes 10,000 hectares, by 2030 ~40,000 hectares of trees will have been planted for an estimated establishment cost of US$50-60 million. The Global Innovation Lab for Climate Finance also analysed the potential for scale beyond the Proponent's own operations[23]. A market potential for farm forestry on degraded land of ~US$ 20 billion annually by 2030 has been calculated, based on African countries' land restoration targets. At US$ 1,500/hectare for establishment costs, this translates to a need for US$ 8.5 billion in initial investment.

Future SPVs could also bundle contracts from several forestry companies to further diversify risk and reach larger issuances. There are a number of smallholder tree contracting pilots under implementation with international organizations in East Africa, including in Tanzania, Uganda, and Mozambique, which may be able to adopt a similar approach to scale up. Other smallholder forestry projects, such as those run by out-grower programs, conservation funds, and NGOs, as well as intermediaries operating in other sectors, such as agriculture, may also raise financing using this approach. The success and promotion of this mechanism could also help to encourage new private sector intermediaries, as well as improvements in regulation and permitting to facilitate the scaling up of smallholder forestry projects.

[20] http://www.simplepovertyscorecard.com/KEN_1997_ENG.pdf
[21] Technical Report on the National Assessment of Forest and Landscape Restoration Opportunities in Kenya 2016. At: http://afr100.org/sites/default/files/Kenya_Technical%20Report_Assessment%20of%20National%20Forest%20and%20Landscape%20Resto..._0.pdf
[22] http://www.undp.org/content/dam/kenya/docs/UNDP%20Reports/Forest%20Landscape%20&%20Kenya%27s%20Vision%202030.pdf
[23] https://www.climatefinancelab.org/wp-content/uploads/2018/02/Smallholder-Foresty-Vehicle_Instrument-Analysis.pdf

Figure 3: Smallholder Forestry Vehicle Replication and Scale Strategy



Acknowledgements

Prepared by Komaza and led by Tomonobu Kumahira (tomonobu.kumahira@komaza.org), with support from PwC UK. This blueprint was largely adapted from a case study from The Global Innovation Lab for Climate Finance[24].

Many thanks to Leigh Madeira (CPI) and the CPIC Forests Working Group for their valuable contributions.

[24] https://www.climatefinancelab.org/project/harvest-contract-vehicle/