



# **LandscapeCPR:** Collective, Participatory Restoration of Smallholder Agricultural Landscapes



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## 1. *Overview of the conservation need / opportunity*

Predominantly smallholder agricultural landscapes in rural Africa are undergoing decades-long continuous crop production coupled with poor land management practices that have exhausted agricultural soils. People traditionally responded by expanding into new areas resulting in agricultural extensification.

Many smallholder agricultural landscapes are part of a complex landscape mosaic that includes areas of high biodiversity value. One type of extensification is the conversion of riparian zones into farmland, causing severe landscape degradation. This has distant impacts from water pollution and reduced surface flow for conservation areas downstream.

Beyond biological and physical impacts, land degradation has serious social consequences. Degraded rural landscapes suffer from outmigration of youth, mostly young men, leaving behind an ageing population. With the loss of human capital, there is a loss of social capital. The ability to restore degraded land collectively is significantly reduced with fewer youth and skilled people who remain in degraded communities.

The current discourse on financing land restoration argues that private finance is necessary to achieve global restoration targets. Rural agricultural smallholder communities have become unbankable however and remain highly depended on traditional donors. We need innovative business models and strategic investments to reverse the cycle of disinvestment and reduce dependence of these communities on external aid.

The proposed model provides a blueprint for private investments in rural farmland that will restore degraded landscapes, revitalize communities, and preserve areas of high biodiversity value. Private investments are used to set up farms in micro-catchments (see Figure 1), explained further in Section 3 below.

The International Center for Tropical Agriculture (CIAT) has worked with Makueni County government (Kenya) and local communities over the last two years to develop a business model that is contextually appropriate to the region's farm systems and land use. This CPIC blueprint presents the LandscapeCPR (Landscape Collective Participatory Restoration) approach with three example business cases in Kaiti, Kilome and Kibwezi West sub-counties in Makueni County (Appendix A).

The full business model is published in a CIAT Report titled *Landscape Restoration Fund for a Landscape CPR Business Model*. Parts of this report are copied below in this CPIC business blueprint. The report also presents a framework for a potential Restoration Fund that can be set up in Makueni County, or be modified for any other county in Kenya.

In Kaiti sub-county, the target restoration catchment is in an area suffering from continued gully erosion where some gullies have been growing for 20+ years. Local (Ward-level) government

resources are limited and community members lack the technical capacity to restore these gullies and reverse erosion.

This area has also seen significant outmigration of youth. Baseline household surveys indicate significant incidence of hunger and malnutrition. The riparian zones are completely occupied with small farm plots of 10-100 m<sup>2</sup>. The conservation impact in Kaiti sub-county is the continued degradation of riparian zones which serve as important biodiversity habitats for pollinators and pest control species, important ecosystem services in agricultural landscapes. Degraded riparian zones also continue pollution and reduction of surface flows that are important for protected areas downstream such as in Tsavo National Park.

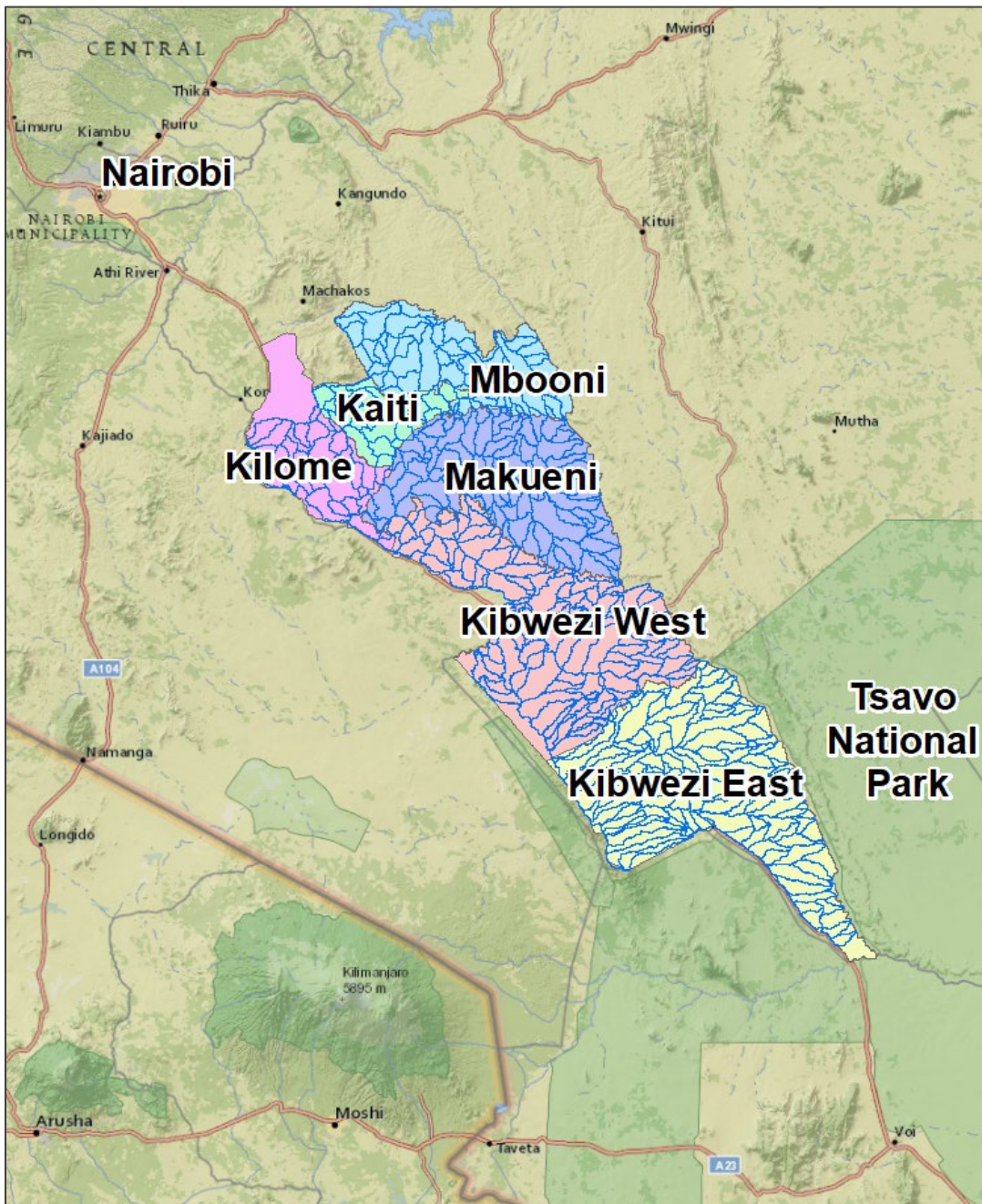


Figure 1. Location of Makueni County and six sub-counties. All rivers in Makueni County flow in a southeast direction, passing through Tsavo East and Tsavo West National Parks. Blue lines depict the micro-catchment boundaries.

In Kilome sub-county, the restoration of micro catchment is located in an area that has gone through rapid transformation in the last 15 years. Remote sensing analysis indicates that this area was an open wildlife space as recently as 2000. During a 15-year period, the area was transformed into smallholder farmland. Community meetings have revealed that the area was completely deforested during this time with few patches of native vegetation remaining. The immediate conservation threat is the continued expansion of farmland into wildlife areas.

In Kibwezi West sub-county, land holding are generally larger as the area is drier (~ 300 mm annual rainfall) with lower population density. Kiwezi West and Kibwezi East sub-counties border Tsavo East and Tsavo West National Parks, one of the world's largest national parks. These parks are home to the critical wildlife (including elephant, buffalo, lion, leopard and rhino). All Makueni County rivers and tributaries flow through Tsavo National Park. Continued land degradation in Makueni County also increases pressure on resources within the park boundaries.

## 2. *Describing how the Blueprint contributes to conservation goals*

### **Overall statement**

This blueprint contributes to restoring smallholder agricultural landscapes. This is achieved by investing in farms that create financial, social and environmental returns. The model is designed to set up community cooperatives that are guided to develop a landscape restoration plan.

The farm management invests in community revitalization and restoration activities through assistance in setting up tree nurseries, providing alternative options to farmers who have occupied riparian zones, and providing training in sustainable land management and improved agronomic practices. Community members will also be trained in monitoring of restoration impacts, e.g. measuring water flow and quality.

### **Identifying key metrics**

1. **Increased tree cover in ecologically sensitive zones.** Suitable tree seedlings will be provided to current plot owners in riparian zones. Trees and native grasses are an important part for gully restoration.
2. **Increased crop, tree and plant diversity.** A more diverse landscape provides more resilient habitat for species that provide pollination and pest control services. They also increase resilience for families in terms of diverse tree crops, e.g. avocados. We plan to use the Agrobiodiversity Index
3. **Improved soil quality.** Proper soil management increases organic carbon over time, which increases soil water holding capacity, allowing efficient uptake of nutrients and improves resilience to drought.
4. **Increased water availability.** Increased water availability is an important factor in downstream conservation areas. This will be achieved through both collective terrace restoration, riparian zone restoration, and installation of water pans to avoid further decline in water availability. Efficient irrigation infrastructure will be installed on the collective farm.
5. **Increased knowledge of sustainable land use management practices.** To assess the ongoing sustainability of the initiative, another key metric for success will be improvement in farmers' knowledge of and ability to implement sustainable farming practices in the long-term.

Standardized Global Impact Investment Network IRIS metrics for social, environmental and financial performance may include (<https://iris.thegiin.org/metrics>): Units/Volume Produced (PI1290), Units/Volume Sold: Total (PI1263), Land Directly Controlled: Sustainably Managed (OI6912), Biodiversity Assessment (OI5929), Threatened Species Policy (OI1618), Ecosystem Services Provided (PD8494), Type of Land Area (PD3922), Area of Trees Planted: Total (PI4127), Producer Price Premium (PI1568), Units/Volume Purchased at Price Premium (PI2422), Pesticide Use (OI9891), Land Directly Controlled: Treated with Pesticides (OI2569) and Ecological Restoration Management Area (PI9556).

### 3. *The business model*

#### **Organisation and governance**

LandscapeCPR works by developing profitable and professionally managed farms that act as drivers of restoration (restoration engines) at the micro-catchment scale. Rather than develop one restoration master plan for all of Makueni County (~800,000 hectares), LandscapeCPR focuses on micro-catchments that are 2,000 hectares on average (see Figure 1). The SWAT hydrologic model was used to delineate roughly 400 micro-catchments. We aim to set up LandscapeCPR farms in 100 most degraded catchments which is roughly 25% of Makueni County area or roughly 200,000 hectares.

The advantage of working at the 2,000 hectare scale is that communities can be engaged to collectively develop catchment restoration plans. Most catchments fall within the boundaries of one Sub-county and one Ward which makes the administrative process easier as each sub-county and Ward office must be consulted. The micro-catchments usually cover multiple villages which means greater need for collective planning and implementation among villages. Given the relatively small scale, it is possible to literally “see” the boundaries of a catchment from a central location, which allows community members to envision a future restored landscape with new biodiversity corridors, agricultural production zones, restored gullies and flowing stream, thereby increasing community ownership.

The portion of financial returns from the farm that support restoration activities ranges from USD 1,000 to 2,000 per month after the farm is fully operational. These activities are planned and implemented by a farmer cooperative that will develop a landscape restoration plan. This size of investment can be absorbed by rural smallholder communities where people’s income are near the poverty line of USD 2 (PPP) per day. One potential risk of the LandscapeCPR model is the lack of availability of land for purchase or lease. However, during preliminary community sensitization meetings in late 2019, we found that all communities have land available and were eager to support the LandscapeCPR model.

We aim to set up LandscapeCPR farms in 100 micro-catchments in four years which equates to a restored area of 200,000 hectares. The cumulative environmental and social impact of investments in LandscapeCPR will have measurable financial, social and environmental returns.

The organization and governance structure of LandscapeCPR is explained in more detail in the CIAT Report of the same title. The text below is copied from the Executive Summary of the report.

The LandscapeCPR business proposed in this document is a farm development and asset-management model, in which an asset manager operating equitably, transparently and on a “do no harm basis” develops investment opportunities for impact investors seeking financial, environmental and social returns by organising:



- Purchase of a farm (“LandscapeFarmCo”) following a due diligence process which ensures the land purchase process will not disadvantage vulnerable individuals or communities in areas in which the farm is located
- Investment for restoration of the farm’s ecological function and productivity increase
- Creation of an outgrower network of smallholder farmers into a professionally-managed farmer cooperative, which supplies LandscapeFarmCo (the “nuclear farm”) with produce. Produce off-take contracts will require land restoration as a condition of produce sale, and
- Sale of the improved farm and its outgrower network to either the farmer cooperative or a third party buyer, thereby returning investment funds to investors

The business will take the following structure organised as an **investable** and **exitable** structure into four components, elaborated below Figure 2.

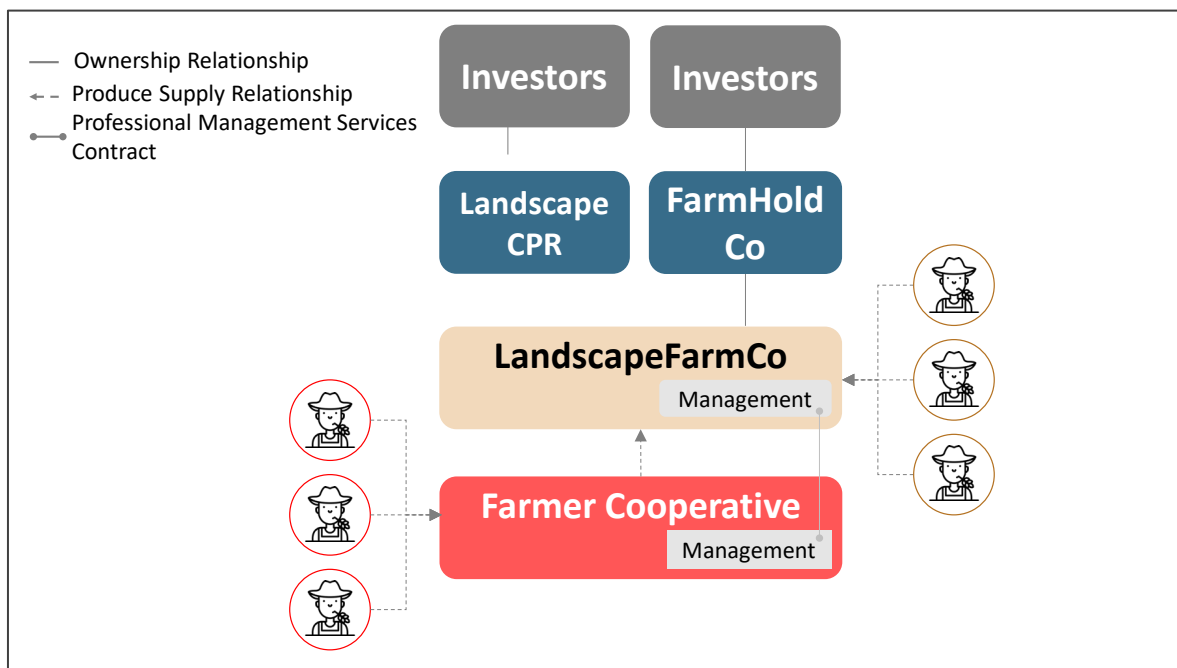


Figure 2: LandscapeCPR business structure.

LandscapeCPR will be able to set up and run clones of LandscapeFarmCo, both within one landscape and across multiple landscapes. As such, the model is designed to be both **replicable** and **scalable**.

The business is also designed to be “exitable”. Within a defined timeframe, LandscapeCPR will arrange for the sale of LandscapeFarmCo and its associated outgrower network to either the Farmer Cooperative or an aligned third party buyer.

### Products and services being sold

Three levels of products and services will be sold.

At the farm level, each “restoration engine farm” (LandscapeFarmCo) will produce farm products that are suitable for local agro-ecological conditions and meet the interests of the community. For example, the Kilome community expressed an interest in producing French Beans and pomegranates. In Kibwezi West, the focus will be on finger millet while communities in Kaiti are already members of a dairy cooperative and wish to invest in drought tolerant varieties of improved forages.

LandscapeCPR will also provide expertise as a consulting service, and it will sell sustainable farm companies after a set time period (e.g. the exit strategy). During the farm maturation period, the farmer cooperatives will be supported to develop proper institutions and governance structures so that they are capable of purchasing the farms after several years. Additional details of the different components of LandscapeCPR, their functions and products/services sold, are below:

- **“LandscapeCPR”**: will (i) organise investment for development of new farms, (ii) incorporate, build and sell sustainable farm companies, and (iii) provide proprietary expertise, know-how and farm management systems for set up of farming businesses, all on the LandscapeCPR model. LandscapeCPR is the asset manager.
- **“LandscapeFarmCo”**: will (i) acquire land, (ii) establish farming systems for (a) increased on-farm produce yield, (b) improvement of ecological function, and (c) marketing and sale of produce. Improved farming systems will comprise (i) assets such as boreholes, irrigation systems and water storage, as well as (ii) management systems for those assets and farm staff. LandscapeFarmCo will be owned by FarmHoldCo.
- **“FarmHoldCo”**: will hold the investment in underlying farming assets, which will be held in the name of the investors. Multiple FarmHoldCos will ultimately be established.
- **“Farmer Cooperative”**: will organise and mobilise smallholder farmers for distribution of inputs, training, production and produce aggregation. LandscapeFarmCo will take an ownership share in the cooperative in order to ensure that a professional management supplied by LandscapeFarmCo under a management services contract will manage the Farmer Cooperative.

## **Cash flows and commercial sustainability**

The investment costs and expected cash flow figures for each of the three case studies are presented in Appendix A. As can be seen in these tables, we assume that each investment will be paid off in two years with 5% interest. This assumes that investments are made by impact investors with patient capital.

Depending on the commodity and initial state of each farm, we expect an initial investment of USD 75,000 to 125,000 per LandscapeFarmCo enterprise. Restoration of 100 landscapes thus requires an investment of approximately USD 10,000,000 (USD 10 million).

Factors that determine this start-up cost include lease vs purchase of land, need for irrigation investment (e.g. borehole), and full farm infrastructure. Management costs will be determined by the level of soil degradation of the farm at start-up. While labour is generally available and cheap, LandscapeCPR aims to hire at least 50% women and pay competitive wages inclusive of benefits.

Fully functional farms will be sold, or the lease transferred, after 7 to 10 years. By this time, farmer cooperatives are fully developed with strong governance structures and they will have the first option to buy or take over the lease. If financing is not available, farms will be sold to a 3<sup>rd</sup> party buyers. After this time, we expect that community revitalization will be noticeable and measurable, and annual investments in restoration activities will continue to have environmental returns (e.g. restored riparian zones that increased surface flows).

Investments in landscape restoration will also be income generating. For example, the Kilome community plans to invest in pomegranate production (such that it fits with the landscape restoration plan) and these trees will start producing when they reach maturity after five years. Increased milk production will have financial returns within the first year in Kaiti.

## External dependencies

LandscapeCPR has some external dependencies that are further elaborated in the business model report. A summary is below:

1. **Land availability.** East Africa has developed an active land commodity market in recent years. Land is becoming less tied to cultural and meaning and is increasingly a commodity that is actively bought and sold by all sectors of society. Preliminary community meetings has indicated an abundance of land for sale in each of the three intervention sites, and community members are very supportive of the business model, seeing clear benefits. Nevertheless, we will develop an assessment of each land purchase or land lease to ensure that no people are disenfranchised in the process. This “do no harm” principle is a critical piece of the LandscapeCPR business model.
2. **Riparian Zone Restoration.** People who have ‘occupied’ riparian zone are most likely also the most vulnerable members of a community. It is important to take care of the most vulnerable groups in each community which include women, the elderly and ethnic minorities.
3. **Government buy-in.** The Makueni County Restoration Fund is an innovative way to rapidly scale up the LandscapeCPR model. However, without the Fund, the model can also work. Moreover, at the local Ward level (the third smallest administrative level after county and sub-county), we have thus far received enormous support for this business model.

## Risk management

The business model has several risks that must be considered

1. **Access to market.** The success of the initiative vitally depends on the farm manager’s ability to sell the farm products. This is the main revenue stream for the farm. The community will also increase profits, e.g. from milk and pomegranate, but these are outside the LandscapeCPR model. Farms will not be set up without prior commitments from offtakers in Nairobi, e.g. for French Beans.
2. **Access to Investors.** While successful intensive farming operations have successfully obtained private financing, the LandscapeCPR business model with the community and landscape restoration mandate is new to investors and there is a risk that investors are not willing to engage in an unproven business. Grants may be necessary to develop a proof-of-concept in order to reduce the risk of later-stage investors.
3. **Willingness of key stakeholders to participate.** Under the LandscapeCPR approach, there is an assumption that community members can be organized in a cooperative to plan and implement landscape restoration activities. Kenya has a long history of developing community cooperatives, e.g. ‘saccos’, and we are confident that this will not form a major constraint.

#### 4. *The investment model*

##### The financial instruments being sought to fund the business model

A general funding ecosystem for similar investments is shown in Figure 3 below. A model that operates in the impact investment space requires a modified funding ecosystem as shown in Figure 4. Ultimately, a combination of different financial instruments, e.g. blended finance, are sought.

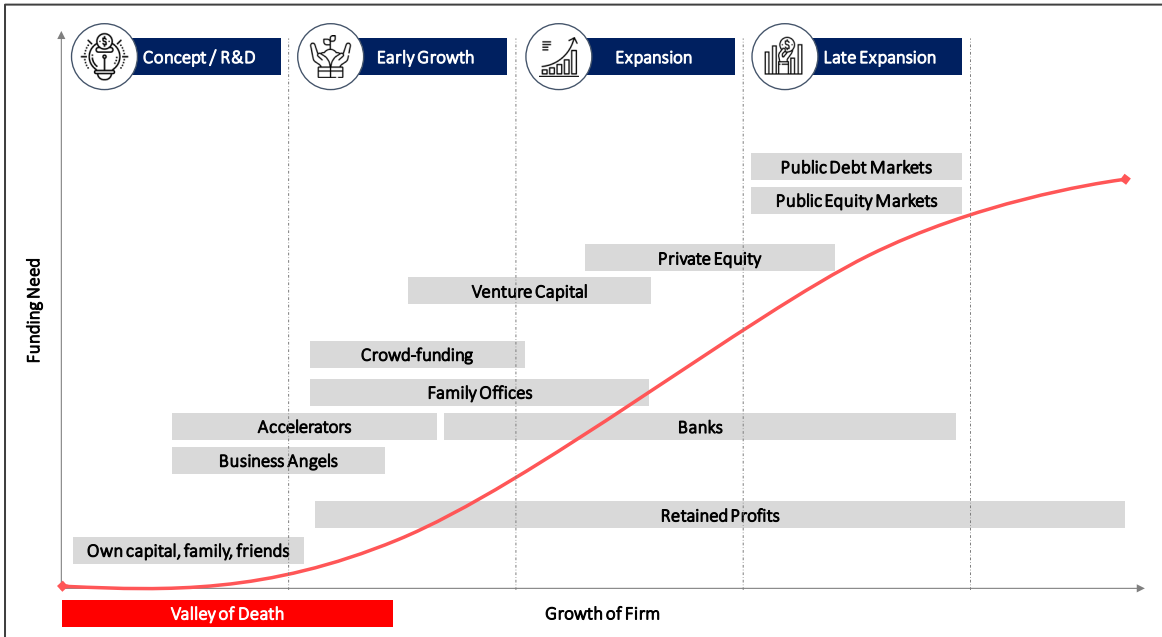


Figure 3. Generalised funding model.

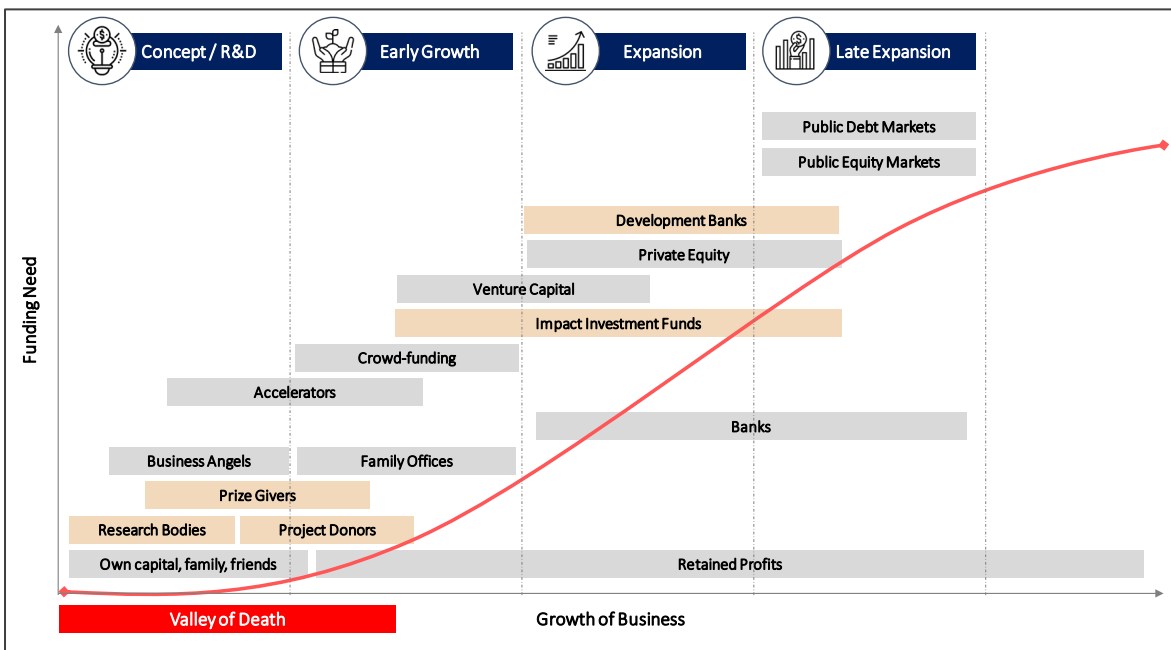


Figure 4. Impact investment funding model.

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

If LandscapeFarmCo were to be financed entirely by debt from an impact investor, e.g. patient capital, it requires an investment of USD 75,000 to 125,000 for each farm which can be paid off in two years at 5% interest. These terms will vary depending on the location, the condition of the initial farm, and the required investment in infrastructure (e.g. some places do not require a bore hole). In order to set up 10 to 15 farms in year 1, LandscapeCPR requires a USD 1.25M investment.

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

LandscapeCPR will make use of the following forms of capital, particularly in their early stage:

Table 1: Description of relevant financial instruments.

	<b>Funding Type</b>	<b>Description</b>
1	Grant	A grant is an award, usually financial, given by one entity (typically a company, foundation, or government) to another, often an individual or a company, to facilitate a goal or incentivize performance. Grants are essentially gifts that do not have to be paid back, under most conditions
2	Equity Investment	An equity investment is money that is invested in a company by purchasing shares of that company
3	Loans	An investment in a business repayable with interest at fixed time periods
4	Convertible Loans	A loan which rather than being repaid converts to shares in accordance with a defined event

LandscapeCPR may move through the following stages of investment, raising funds from the identified entities:

<b>#</b>	<b>Funds Provider</b>	<b>Capital Type Available</b>
1	Own Capital, Family & Friends	Equity investment, loans
2	Research Donors	Grants
3	Project Donors	Grants
4	Research Donors	Grants
5	Business Angels	Equity investment, Convertible loan
6	Family Offices	Equity investment, loans, grants
7	Accelerators	Equity investment, loans, convertible debt
8	Banks	Loans, Trade Credit, Overdrafts
10	Crowd-Funding	Equity investment, loans
11	Impact Investment Funds	Equity investment, loans
12	Venture Capital	Equity investment
13	Private Equity	Equity investment
14	Development Banks	Equity investment, loans
15	Public Equity Markets	Equity investment
16	Public Debt Markets	Bonds

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

The next step is to develop a full business plan with associated financial projections including justification for grant funding and mitigation instruments.

### **The exit strategy employed**

*This section is copied from Section 4 in the CIAT Report.*

The model will return value to investors, (i) in the short term through sale of agricultural produce, and (ii) in the long term by sale of mature farms as a going concern to either investors who share the investment objectives of the business or landscape-based farmer cooperative groups. The farmer cooperative members will be the outgrowers developed by the LandscapeFarmCo business, such that the sale is to the outgrowers themselves, thereby creating a locally-owned vehicle for sustainable landscape management once the LandscapeCPR business has exited.

These returns will attract the private investment necessary to both set-up the farms, and finance buy-out of the farm when it reaches maturity.

We aim to achieve the exit within 7-10 years, matching investor fund cycles. Whilst the landscape restoration cycle may take up to 25 years, it is intended that systems are embedded, stable and functioning autonomously over a shorter time period.

In order to facilitate this exit, LandscapeFarmCo will be set-up by a farm development and asset-management company (LandscapeCPR) which also holds the intellectual property relating to management systems used to set up and run LandscapeFarmCo. Once LandscapeFarmCo is sold, LandscapeCPR will collect the proceeds of the sale and return this sum to investors, less its share of the return. Subject to requirements, investors can also invest directly in LandscapeFarmCo and exit upon sale of shares. Both models may be required because many funds are restricted in the geographical mandate of their funds.

### **Innovative features of the investment model**

This is not a new business model. Farm development businesses exist around the world, and some also add sustainability as a dimension to their management. For example, several businesses acquire commodity farmland, develop it into an organic farm and run it on behalf of their investors before disposal at a supposed increase in price. Examples of such businesses include Farmland LP, Impact Ag, Iriquois Valley, Land Fund Partners, Local Farms Fund, Sustainable Farm Partners and Biological Capital, all of which are US-focused.

The “nucleus” farm/outgrower model is also not an innovation, as many such businesses exist in East Africa. The novelty of LandscapeCPR is leveraging these models to incentivize adoption of sustainable agricultural practices and participation in the wider landscape, which builds on a track record of experience of training smallholders in Good Agricultural Practices by the contracting off-taker.

The innovation in the above-described approach is in linking the asset management model to the outgrower model as a vehicle for financial and environmental returns at scale in a landscape.

### **Replicability and Scalability**

LandscapeCPR is replicable and scalable across other smallholder landscape geographies. We are in the process of developing concept notes and proposals for different grants, and we plan to seek input and funding from private (impact) investors.

## **APPENDIX A**

Potential LandscapeFarmCo Investments in  
Kaiti, Kilome and Kibwezi West Sub-counties,  
Makueni County, Kenya.



Three business cases are presented below for production of (1) improved forages in Kaiti, (2) French beans in Kilome and (3) finger millet in Kibwezi West. For each business case, a potential partner has been identified. For Kilome and Kibwezi West, these are private companies, and for Kaiti, this is a local cooperative.

Depending on the case, the initial investment varies, as do the return on investment and total investments in restoration activities after five years. For each case, LandscapeFarmCo companies will be set up and are expected to have positive balances after three years.

### Business Case 1

Location: Kaiti Sub-county, Makueni County, Kenya

Crop: Improved Forages

Partner Organization: Local Dairy Cooperative

Water Availability: No

Land Title: Yes

Initial investment: USD 75,000

Landscape Investment after 5 Years: USD 31,000

Farm Size: 5 acres

Expected balance sheet for <i>Improved Forages</i> produced in Kaiti Sub-County								
Year	Month	Loan Balance	Loan Interest	Loan Payments	Management Costs	Restoration Investments	Total Income	Cash On Hand
0	0	(75,000)						75,000
						<b>Balance after Initial Investments</b>		<b>42,750</b>
1	12	(51,081)	(3,294)	(29,000)	(14,400)	-	29,000	25,056
2	24	(16,892)	(1,668)	(36,000)	(14,400)	-	36,000	8,988
3	36	-	(185)	(15,147)	(14,400)	(7,000)	36,000	8,256
4	48	-	-	-	(14,400)	(12,000)	36,000	17,856
5	60	-	-	-	(14,400)	(12,000)	36,000	27,456
			(5,147)	(80,147)	(72,000)	(31,000)	173,000	
<b>5% Annual Interest Rate</b>			<b>Loan Amount</b>	<b>\$ 75,000</b>				
Item	Unit	Cost	Count	Total				
<b>Startup Costs</b>								
Land	Acre	3,000	5	15,000				
Borehole		15,000	-	-				
Solar Panels	Panel	250	5	1,250				
Drip Irrigation + tanks	Acre-pipes-tank	900	-	-				
Land Preparation	Acre-terraces	200	5	1,000				
Physical Infrastructure	Housing	14,000	1	14,000				
Transport		1,000	1	1,000				
				<b>Total</b>	<b>32,250</b>			
<b>Monthly Management Cost</b>								
Labor	person-month	500	1	500				
Inputs	per month	500	1	500				
Transport		200	1	200				
				<b>Total</b>	<b>1,200</b>			

## Business Case 2

Location: Kilome Sub-county, Makueni County, Kenya

Crop: French Beans

Partner Organization: International Export Company

Water Availability: Yes

Land Title: Yes

Initial investment: USD 125,000

Landscape Investment after 5 Years: USD 60,000

Farm Size: 5 acres

Expected balance sheet for <i>French Beans</i> , produced in Kilome Sub-County								
Year	Month	Loan Balance	Loan Interest	Loan Payments	Management Costs	Restoration Investments	Total Income	Cash On Hand
0	0	(125,000)						125,000
Balance after Initial Investments								42,650
1	12	(76,081)	(5,398)	(60,000)	(30,000)	-	60,000	7,252
2	24	-	(1,657)	(72,055)	(30,000)	-	84,000	(12,461)
3	36	-	-	-	(30,000)	(12,000)	84,000	29,539
4	48	-	-	-	(30,000)	(24,000)	84,000	59,539
5	60	-	-	-	(30,000)	(24,000)	84,000	89,539
			(7,055)	(132,055)	(150,000)	(60,000)	396,000	
5% Annual Interest Rate			Loan Amount	\$ 125,000				
Item	Unit	Cost	Count	Total				
<b>Startup Costs</b>								
Land	Acre	8,000	5	40,000				
Borehole		15,000	1	15,000				
Solar Panels	Panel	250	27	6,750				
Drip Irrigation + tanks	Acre-pipes-tank	900	4	3,600				
Land Preparation	Acre-terraces	500	4	2,000				
Physical Infrastructure	Housing	14,000	1	14,000				
Transport		1,000	1	1,000				
				<b>Total</b>	<b>\$ 82,350</b>			
<b>Monthly Management Cost</b>								
Labor	person-month	500	2	1,000				
Inputs	per month	1,000	1	1,000				
Transport		500	1	500				
				<b>Total</b>	<b>\$ 2,500</b>			

### Business Case 3

Location: Kibwezi West Sub-county, Makueni County, Kenya

Crop: Finger Millet

Partner Organization: Nairobi-based Food Processing Company

Water Availability: No

Land Title: Yes

Initial investment: USD 125,000

Landscape Investment after 5 Years: USD 120,000

Farm Size: 20 acres

Expected balance sheet for <i>Finger Millet</i> produced in Kibwezi West Sub-County								
Year	Month	Loan Balance	Loan Interest	Loan Payments	Management Costs	Restoration Investments	Total Income	Cash On Hand
0	0	(125,000)						125,000
Balance after Initial Investments								30,750
1	12	(60,842)	(5,095)	(78,000)	(42,000)	-	78,000	(16,345)
2	24	-	(734)	(52,829)	(42,000)	-	108,000	(3,907)
3	36	-	-	-	(42,000)	(24,000)	108,000	38,093
4	48	-	-	-	(42,000)	(36,000)	108,000	68,093
5	60	-	-	-	(42,000)	(60,000)	108,000	74,093
			(5,829)	(130,829)	(210,000)	(120,000)	510,000	
5% Annual Interest Rate			Loan Amount	\$ 125,000				
Item	Unit	Cost	Count	Total				
<b>Startup Costs</b>								
Land	Acre	3,000	20	60,000				
Borehole		15,000	-	-				
Solar Panels	Panel	250	5	1,250				
Drip Irrigation + tanks	Acre-pipes-tank	900	-	-				
Land Preparation	Acre-terraces	200	20	4,000				
Physical Infrastructure	Housing	14,000	2	28,000				
Transport		1,000	1	1,000				
				<b>Total</b>	<b>\$ 94,250</b>			
<b>Monthly Management Cost</b>								
Labor	person-month	500	4	2,000				
Inputs	per month	1,000	1	1,000				
Transport		500	1	500				
				<b>Total</b>	<b>\$ 3,500</b>			



## Alliance

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Biodiversity International and the International Center for Tropical Agriculture (CIAT) are CGIAR Research Centers

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