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Participatory feasibility analysis of the Beekeeping (lot 1) / Ecotourism (lot 2) / Native Tree Seeds and Seedlings (lot 3) Value Chain products in six established Community Biodiversity Sancta (CBS)

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Deliverable 3. Progress report 2

RFA Rwanda Forestry Authority

Sida

Enabel

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1 Reminder on the assignment's context and objectives

The Eastern Province of Rwanda, spanning 9,813 km², encompasses diverse ecosystems, from mid-altitude mountains to lowland savannas, and includes the Akagera National Park, the only grassland protected area hosting the "big five" mammals in the country. Despite this natural wealth, the province, with a population of 3 million (24% of Rwanda's total population), faces significant socio-economic challenges: as of 2017, according to the fifth Integrated Household Living Conditions Survey 5 (EICV 5) one-third of the country's population lived in poverty, with 15% in extreme poverty, and 70% depended on agriculture, leading to severe land degradation and reduced productivity. Climate change exacerbates these issues, causing frequent droughts, floods, and erratic precipitation patterns, threatening livelihoods and biodiversity.

To address these challenges, Rwanda has launched strategic initiatives such as Vision 2050, aimed at transforming the country into a high-income nation, and the Green Growth and Climate Resilience Strategy (GGCRS) introduced in 2023 to achieve carbon neutrality and sustainable economic growth. Additionally, the Rwanda Biodiversity Policy (2011) and the National Forestry Policy (2018) aim to conserve biodiversity and restore forest ecosystems, with a commitment to restore 2 million hectares of forest by 2035. Collaborative projects like the Alliance for Restoration of Forest Landscapes and Ecosystems in Africa (AREECA), TREPA, and DESIRA focus on enhancing climate resilience, sustainable agriculture, and biodiversity conservation. Rwanda committed to be a knowledge-based country and that is where tourism and other services fit in the developmental framework.

The COMBIO project, funded by the Swedish International Development Agency (SIDA) and implemented by ENABEL, aims to conserve and enhance biodiversity while promoting sustainable livelihoods in Rwanda's Eastern Province. Key objectives include restoring biodiversity by establishing a network of 14 Community Biodiversity Sanctuaries (CBS) on degraded state-owned lands managed by Community-Based Cooperatives (CBCs), increasing biodiversity-supportive areas by integrating native species into crops and forest lands, and promoting biodiversity and nature-based solutions among communities, government agencies, and district authorities.

Each CBS will typically feature nurseries for native tree seedlings, botanical gardens for education , and optional elements such as ecotourism initiatives, native species pharmacopeia, fruit tree orchards, essential oil gardens, nature discovery circuits, and facilities for processing and marketing nature-based products. The CBCs will manage the nurseries and plantations, ensuring community participation and preventing encroachment, with members compensated for their work and supported by field technicians. Additionally, Clean Cooking Hubs will be established to reduce wood consumption through efficient cooking stoves and alternative fuels. Through these initiatives, the COMBIO project aims to restore degraded lands, enhance biodiversity, and improve community livelihoods through sustainable, participatory approaches.

The fourth objective of the COMBIO project aims to ensure the self-sustainability of each Community-Biodiversity Sancta (CBS) by the project's conclusion. This entails the development of economically viable value chains (VCs) within the CBSs, generating significant financial revenue for the cooperative. To address this objective, Enabel enlisted the expertise of consulting firms, with SalvaTerra chosen to conduct a comprehensive analysis of three nature-based VCs: beekeeping, ecotourism, and native tree seeds and seedlings.

This analysis is intended to result in the creation of viable Business Plans (BPs) tailored to each selected VC in every established CBS. These plans will be adapted to local conditions and will outline the necessary functional and financial support required for successful implementation.

Throughout the assignment, the overarching goal is to empower local communities. This involves planning the establishment of community revolving fund mechanisms, facilitating the integration and monitoring of biodiversity indicators, and disseminating scientific knowledge on biodiversity through awareness campaigns and education programs.

The study is structured into two collaborative phases. Phase 1 involved conducting a thorough Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of the three identified VCs across 12 CBS, followed by the provision of actionable recommendations.

The first phase of the COMBIO project was successful, with all planned activities completed thanks to the support and coordination of ENABEL officers and the active participation of CBS members throughout the consultative process. Initial focus group discussions and workshops were productive and dynamic, showing high engagement, especially from women and youth, despite varying levels of participation and cohesion across different CBS. Committee members were notably more active.

Newly established CBS faced challenges in providing solid inputs due to their recent formation, but visits and discussions allowed for preliminary assessments of each VC's SWOT analysis. Key concerns included the risks of starting new businesses with a generally low-skilled population and emerging governance structures that could lead to divided leadership and monopolization of economic power. Large membership sizes also posed risks due to inadequate organizational structures and the innovative nature of the proposed VC activities, necessitating extensive structuring work and ongoing support during implementation.

CBS members showed high interest in VCs with high revenue potential, such as Beekeeping and Ecotourism. Beekeeping was seen as having better implementation potential due to secure market opportunities for honey. Ecotourism, though new to the Eastern Province, was considered feasible only with ensured visitor presence, such as from the main road from Akagera National Park or at the Rusumo border crossing.

Gender equality and women's empowerment were integral to the focus group discussions and workshops, with generally high involvement from women committee members and groups led by women showing more inclusive leadership. Supporting women's leadership in the initial project stages is essential to ensure shared decision-making. Women were particularly interested in post-harvest activities. Youth participation was strong, especially among those with higher education levels, with young people expressing interest in entrepreneurship activities like ecotourism promotion. Ensuring youth involvement in marketing and sales strategy and promoting specific roles for their empowerment were suggested for their continued engagement and contribution.

This report presents the outcomes achieved during Phase 2 of the study, focusing on the development of detailed business plans and roadmaps for six established CBS.

2 Main activities included under Component 2

Preparation of field mission #2

The consultants prepared a detailed plan for the second field mission, which took place from April 29th to May 05th, 2024. In preparation for this mission, templates for roadmap development and business plan, as well as main hypotheses, were developed.

Value chain stakeholders, especially upstream private stakeholders, were contacted prior to the mission, to fix interviews in Kigali. These meetings aimed to deepen understanding on potential for linking up cooperatives and purchasers.

Interview guides prepared by the team aimed to gather detailed information on various aspects, including the legal status of entities, annual activities and quantities of products processed/marketed, successes and operational challenges, financial capacity, gender distribution of employees, existing equipment and facilities, sourcing of input materials, output products, price trends, opportunities, constraints, and potential risks associated with collaborating with the sancta community cooperative.

Establishment of tentative business plans and roadmap development

In the 6 CBS covered by Component 2, the following activities were carried out :

- **Participatory workshops** involving around 20-25 participants were held. These workshops included all the participants of the first mission's participatory workshops, to ensure continuity.

  These workshops were introduced by Enabel with a quick reminder of the COMBIO project and the CBS approach, and pre-selection process of value chains, before delving into discussions on business plan and roadmaps. Various participatory facilitation techniques were used during the workshops, to allow CBC members to fully express any challenges that may arise during implementation process (land or water access, members organization, etc.).

  Group discussions also allowed collecting further data on production, selling, revenues, organization at the CBS level, and partnerships with stakeholders from both public and private sectors.

Additional information was collected through bibliographic sources, including national reports, on-going or closed projects, low-scale cooperative advancement reports, and other documents.

Interviews with other key stakeholders were to gain insights into their roles and connections with the value chains (VCs), confirm business plan scenario, market dynamics and potential costs / revenues. These stakeholders included local authorities such as forest, tourism, agriculture and social development officers at cell, sector or district level, representatives from projects or public centers involved in the three VCs, honey purchasing companies, and other relevant individuals. These discussions aimed to understand the entity's involvement with the VC, gather general information and data about the VC in the area, obtain detailed information on existing VCs including production processes, equipment/materials, costs, market dynamics, and identify any existing business plans.

Overview (cf. Progress report #1) of pre-selected value chains per CBS

Figure 1 Final opportunity choice by CBS

CBS	Potential of the sector score (based on VC analysis) 0 Very Low – 1 Low – 2 Medium – 3 High – 4 Very High			Final opportunity choice 0: not feasible, 1: may be feasible but not recommended, 2: feasible under certain condition, 3: recommended, 4: highly recommended as priority			Comments
	Beekeeping	Seeds and seedlings	Ecotourism	Beekeeping	Seeds and seedlings	Ecotourism	
Ngoma Zaza	2,32	2,37	0	3	2	1	The CBS site is very well suited for both BK and TSS VCs, and the CBC is incipient, but dynamic and promising. On the other hand, the area is not well connected, and there are strong concerns on marketing, skills, and input acquisition for both VCs.
Kirehe Nyankurazo	1,95	2,21	1,79	3	2	2	The CBS site is a steep hill with no direct access to water and close to the main road, thus limiting the development of infrastructures onsite. The CBC has no experience or skills for BK or ET development but has a history of selling seedlings for afforestation projects.
Rwamagana Murambi	2	1,42	1,26	2	1	1	The CBS site is suitable for BK, but the cooperative has to be organized, trained and accompanied for this new activity. The nursery is situated in a rented private land with a quite difficult access to water, and an accessibility issue for market development of the TSS VC. The CBS is situated on the shores of the lake Muhazi but the development of the ET VC is not recommended due to several challenges.
Kayonza Jambo Beach	1,47	2,11	2	1	3	2	The CBS site is not suitable for BK for security reasons (road). The nursery for TSS VC development is easily accessible (near Kayonza), situated along a main road with water access. The CBS is situated on the shores of the lake Muhazi and close to two existing hotels-restaurants, the ET VC development is possible with a private partner but challenging.
Gatsibo Ryarubamba	1,89	2,16	1,11	2	3	1	The CBS site is suitable for BK processing and selling point, but not for apiary instalment, and the cooperative has to be organized, trained and accompanied for this new activity. The nursery for TSS VC is easily accessible, but without direct water access. ET VC is not recommended due to the lack of assets and potential in the area, aside of pharmacopeia knowledge, not enough to attract visitors.
Nyagatare Karushuga	2,26	1,84	0,95	3	2	1	The CBS site is highly suitable for BK, with half of the members trained as part of a former BK cooperative, but the cooperative has to be organized, trained and accompanied for this new activity. The nursery is located near water source, but its current location faces several challenges such as damages by animals, and remoteness from market opportunities. Despite the site's assets (viewpoints, Akagera and Tanzania proximity, forest and wildlife), ET development is not considered because of the site's remoteness.
Bugesera Nyamata	(removed from the study's scope by ENABEL)						

3 Beekeeping business plan and roadmap

3.1 Beekeeping business plan

The general objective

The general objective of this business is to increase income and livelihood of cooperative members through honey collection, processing and sales. This objective will be achieved through the implementation of the following steps (see the general roadmap for BK below):

1. Structuration and training of CBC members
2. Apiary instalment - primary production
3. Honey processing/packaging instalment
4. Commercialization, marketing and sales

3.1.1 Business plan scenarios and variations

Due to the recent establishment of the cooperatives, and since very few members already have experience in practicing beekeeping (and when they have, this experience is mostly traditional beekeeping), and considering the absence of infrastructure and equipment, there is little room for variable scenarios. The establishment of beekeeping production will therefore have to follow the same steps regardless of the location, number of members, etc. of each CBC.

The main scenario allows for a comprehensive and progressive start and operationalization of honey production and processing business activities for the CBCs. They will receive support in training, apiary building, equipping and functioning, processing unit establishment and operationalization, and sales.

There are however variations to consider according to the baseline situation, and evolution of the cooperative after Year 2:

a. **Low scale / Medium scale honey production**: Feasibility analysis among CBCs revealed varying potentials for success in honey production. Some CBCs, like Nyagatare Karushuga, demonstrated a higher potential due to a significant number of members already trained and knowledgeable in beekeeping and the CBS proximity to a wide variety of forest species. Given the higher chances of success these CBCs, it is suggested to raise the ambition with those cooperative. As a result, two options can be considered for the project

   - **Low scale BK:** start with 20 beehives to be implemented by the end of the COMBIO project (Year 2) while promoting an investment from the cooperative of 20 additional beehives by Year 5.
   - **Medium scale BK:** start with 40 beehives by the end of the project (Year 2) while promoting an investment from the cooperative of 30 additional beehives by Year 5.

b. **Marketing / sales and operational costs**: whereas selling to the local market was considered as the main “default” outlet for the honey produced in the CBSs, the economic feasibility of bulk honey sales to purchasing companies was also evaluated. This was only considered feasible where honey production and processing development is successful, with solid quality control and interannual stability of production volumes.

3.1.2 Market analysis and forecasted business growth

Demand analysis

NB: This section summarizes some of the main findings of the Beekeeping Value Chain analysis presented in the progress report of the first phase of this study.

In Rwanda, honey is harvested twice each year. The main harvesting season occurs between June and October, while the small harvesting season takes place in February and march. In some areas, the small harvesting season is skipped due to adverse environmental or climate conditions. During the main

harvesting season, a well-managed traditional beehive can yield 8 Kg of honey and 1 Kg of beeswax. A modern beehive in good conducive environment can yield up to 40 Kg and 2 Kg of beeswax (NAEB[1]).

Rwanda's internal demand for honey has been growing steadily, driven by the population growth but also because of its good image as a healthy alternative to sugar and because of its culturally acknowledged medicinal properties. Reliable statistics on production and consumption are difficult to obtain as beekeeping is mainly practiced at a small-scale and marketed locally. However, the national demand is estimated to be around 17,400 tons per year, while the gross domestic annual production is around 5,800 tons. The 11,600 tons gap between the domestic demand and supply is covered with importations, with Tanzania being one of Rwanda's main suppliers.

The number of beekeepers in Rwanda is estimated around 120,000. This means that the average honey production per producer is very low, around 48 Kg. This reveals a clear lack of professionalization of the supply side of the value chain, with strong consequences on the competitiveness of national honey when compared with imported alternatives. The national honey production also faces challenges related to pollution with pesticides, and deforestation issues.

However, an enabling environment for the sector has been created by the Rwandan government, positioning Rwandan honey to meet international demands. Specifically, the Beekeeping Law No 25/2013 and the National Beekeeping Strategy 2018-2022 emphasize sustainable practices and quality standards, aligning with international regulations. As a result, since 2016, Rwanda has been accredited to export honey to the European Union, opening new avenues for market growth.

On the demand side, the Value chain is mainly divided between two distinct markets:

- Local informal marketing is the main outlet for small-scale honey production by individual beekeepers and small cooperatives. Honey is typically sold on the processing site or on nearby selling points such as weekly markets and small shops, often without any label. This honey doesn't have any official seal to guarantee its origin or compliance with national standards.
- Certified honey, i.e. honey sold with an official label from the Rwanda Standard Board, is mainly sourced from wholesalers, who collect bulk honey from producers and take charge of the quality control, certification and packaging processes before selling the honey under their own brand to retailers.

The level of integration of these "certified honey" businesses is variable: some wholesalers are also producers (for example large cooperative or unions can sell certified honey under their own brands), while others are merely collectors sourcing their honey from individual producers (or intermediaries). The minimum production required for a producer to enter this marketing channel is of around 200 Kg. While the selling price is typically lower for the producer (around 3,500 to 4,000 RWF/Kg, versus 5,000 to 6,000 RWF/Kg when sold to end consumers), this channel presents the advantages of securing the sale of the whole production, while avoiding all costs related to packaging and transport.

Strategy to grow the business

All CBCs interested in developing BK activities showed a strong preference for selling honey themselves on local markets. Whereas this option seems more complex in various regards (especially because it implies the internalization of processing, packaging and transport processes and related costs), it is also safer in some regards.

- First, the local demand is likely to be enough to absorb the whole production (at least during the first year after establishment). It is usually admitted that word of mouth is strongly working for local honey sales, with local inhabitants used to contact directly honey sellers by phone to place orders. It may however be safer to proceed with local communication at the beginning, allowing product tasting, passing through local distribution channels, and putting on road signs and signposts to attract visitors.
- Second, there is a significant risk that entering the "official" value chain would fail during the first years after establishment, due to insufficient production or quality issues. In this case, CBCs would still require turning to the local market to sell their honey.

[1] https://www.naeb.gov.rw/index.php?id=1

As a result, locally based processing, packaging and selling has been included in the BP for all CBCs. After the first three years of the project (i.e. after COMBIO support stops) it can be advised to open the processing facility for visits and tasting and open a selling point in the nearest town/city. Depending on CBCs success and evolution as well as produced volumes, some may be interest in partnering in the long term with honey purchasing companies.

Some of the most relevant companies for establishing this kind of partnerships are listed below :

Contact name	**District**	**Cooperative or Company name**	**Telephone**
ODOOBU Kelvin	Gasabo	THE HIVE/KIGALI	788660391
UWINGABIRE Solange Murekezi	Gasabo	AUX DELICES/KIGALI	788835588
YUMMY	Gasabo	3N FARM/KIGALI	788510589
UMUBYEYI Martine	Gasabo	MAKADAMIA HONEY/KIGALI	788532952
ALLAM Ahmed	Gasabo	EG HONEY/KIGALI	734000111
HABINSHUTI Marianne	Gasabo	BURANGA LTD/KIGALI	785996776
IYAMUREYE Orest	Gasabo	HONEY HOUSE RWANDA/KIGALI	783580840
BIZIMANA JMV	Kicukiro	BEEKEEPER'S GIFT LTD/KIGALI	788538325
NAHO Joseph	Kicukiro	PURE HONEY/KIGALI	788474207
KABERA Leonard	Kamonyi	THE COOPERATIVE LTD	Non disponible
RYAKUNZE Phoebe	Kicukiro	PHOEBEES	788253353
KABANYANA Keziah	Kicukiro	API ORGANIC RWANDA	788681403
GUMIRA Patrick	Nyarugenge	POLARIS GROUP LIMITED	784694185
KABAYIZA Gilbert	Nyarugenge	ABDC LTD	783110185
JUVENAL	Kicukiro	BIO-HAP LTD/MONAMI NATURAL HONEY	788530236
SHEILA	Nyarugenge	SHEILA LTD/SHEILA NATURAL HONEY	787903137
SHERY	Nyarugenge	SHERY LTD	791501460

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3.1.3 Breakdown of investments

NB : All equipment mentioned in the following tables are presented in the Annex 1 of this document.

Training

Training modules and modalities are described in the below roadmap (see 3.2 Beekeeping implementation roadmap).

Below costs include trainer fees, accommodation and transport. Trainees are compensated around RWF 2,500/day.

Cost items	*Unit cost RWF*	*Number of item/unit*	*Funding source*	*Comments*	*Y1 to Y5*
Training	**3 657 500**				
Initial training and start of production (5 days)	500 000	50	ENABEL	Includes trainer fees + accomodation and transport. Trainees are compensated /rf 2,500/day	*1 125 000*
Training of trainers for autonomous production (25 days)	2 500 000	5	ENABEL		*2 812 500*
Training on processing and quality management (2 days)	200 000	10	ENABEL		*250 000*
Training on marketing and financial management (2 days)	200 000	10	ENABEL		*250 000*
Training on traceability (1 day)	100 000	10	ENABEL		*125 000*
Exchange travel with an existing coop (3 days)	157 500	10	ENABEL	Includes accomodation and transport + 2,500/day	*1 575 000*

Apiaries instalment and production

Few indications about the below table:

- ‘Grevillea complete LS hives’ have costs majored 20% to include transport
- The ‘Acquisition of smokers, suits and other tools – initial’ items include a complete set for one apiary per unit. The costs have been majored 25% to include transport

To ensure the sustainability and financial viability of the business plan, 15% of the investment costs are supposed to be renewed yearly, starting after year 5

Cost items	*Unit cost RWF*	*Number of items/units*	*Funding source*	*Comments*	*Y1 to Y5*
Apiaries instalment and production					
Land preparation and apiary construction (workforce) - initial	25 000	2	ENABEL	Estimated at 10 wd	*50 000*
Land preparation and apiary production (materials) - initial	300 000	2	ENABEL	As estimated by the cooperative and majored	*600 000*

Acquisition of landstroth beehives - initial	81 600	20	ENABEL	Grevillea complete LS hives Price majored 20% to include transport	*1 632 000*
Acquisition of bee colonies - initial	14 400	20	ENABEL		*288 000*
Acquisition of smokers, suits and other tools - initial	210 600	2	ENABEL	Complete set for one apiary, price majored 20% to include transport	*421 200*
Land preparation and apiary construction (workforce) - coop	25 000	3	Coop	Estimated at 10 wd	*75 000*
Land preparation and apiary production (materials) - coop	300 000	3	Coop	As estimated by the cooperative and majored	*900 000*
Acquisition of landstroth beehives - coop	81 600	30	Coop	Grevillea complete LS hives Price majored 20% to include transport	*2 448 000*
Acquisition of bee colonies - coop	14 400	30	Coop		*432 000*
Acquisition of smokers, suits and other tools - initial	210 600	3	Coop	Complete set for one apiary, price majored 20% to include transport	*631 800*
Maintenance and renewal of equipment and infrastructure	7 478 000	0,15	Coop	15% of the complete investment to be renewed yearly after year 5	-

Honey processing and packaging

Few indications about the below table:

- The honey processing and storage facility was estimated as being a 25 sqm construction to be added to the main CBS 'Storage and transformation facilities + clean cooking Hub'
- The set of processing equipment includes all necessary tools for modern and traditional honey extraction, with costs majores 20% to include transport
- Monthly maintenance expenses, are included as well as 15% of the complete investment to be renewed yearly after year 5, covered by the cooperative

Packaging and labeling are priced per liter, all packaging options averaged.

Cost items	*Unit cost RWF*	*Number of items/units*	*Funding source*	*Comments*	*Y1 to Y5*
Honey processing and packaging					
Honey processing and storage facility construction	25 000 000	1	ENABEL	25 sqm honey processing facility all included, not equipped	*25 000 000*
Honey processing and storage facility maintenance	35 000	12	Coop	Monthly maintenance expenses, covered by the cooperative	*1 680 000*
Honey processing equipment acquisition	3 780 000	1	ENABEL	Complete set, not scalable	*3 780 000*
Maintenance and renewal of equipment and infrastructure	3 780 000	0	Coop	15% of the complete investment to be renewed yearly after year 5	-
Consumables acquisition (beeswax sheets, etc.)	50 400	1	Coop	General budget for all consumables, for all beehives	*151 200*
Packaging and labelling acquisition	1 000	1	Coop	Priced per liter, all packaging options averaged	*4 250 000*

Marketing and sales

Few indications about the below table:

- It is suggested to start Y4 for a selling point, upon need and local market dynamic, with monthly rent of 100 000 F for a commercial local in the nearest city

10% of rent and equipment, including signposts, for maintenance, are supposed to be renewed after year 5 by the cooperative

Cost items	*Unit cost RWF*	*Number of items/units*	*Funding source*	*Comments*	*Y1 to Y5*
Marketing and sales					
Selling point renting	1 200 000	1	Coop	Monthly rent of 100 000 F for a commercial local in the nearest city (starting Y4)	*1 200 000*
Selling point equipment	200 000	1	Coop	Shelves, desk etc. for selling point (starting Y4)	*200 000*
Transport	50	1	Coop	Lump sum budget per Kg	*212 500*
Signposts and communication	300 000	1	ENABEL	Lump sum for 10 road signs and signposts	*300 000*
Maintenance and renewal of marketing and sales equipment	1 700 000	0	Coop	10% of rent and equipment, including signposts, for maintenance, after year 5	-

Workforce requirements

It is estimated that (i) at least one full time equivalent is needed for each apiary of 10 beehives per year, which can be splitted between several CBC members; and (ii) one full time equivalent per year is needed for marketing and sales, regardless of quantities produced.

Cost items	*Unit cost RWF*	*Number of items/units*	*Funding source*	*Comments*	*Y1 to Y5*
Worforce requirements					-
Workforce for apiary maintenance, harvesting and processing	600 000	5	Coop	One full time equivalent per year for each apiary of 10 beehives	*9 000 000*
Workforce for marketing and sales	600 000	1	Coop	One full time equivalent per year, regardless of quantities produced	*2 700 000*
					-

Total cost

From the start of the project, up to 2-3 years after closure:

Cost items	*Y1 to Y5*	Y1	Y2	Y3	Y4	Y5
Training						
Initial training and start of production (5 days)	*1 125 000*	1 125 000				
Training of trainers for autonomous production (25 days)	*2 812 500*	2 812 500				
Training on processing and quality management (2 days)	*250 000*	250 000				
Training on marketing and financial management (2 days)	*250 000*		250 000			
Training on traceability (1 day)	*125 000*		125 000			
Exchange travel with an existing coop (3 days)	*1 575 000*		1 575 000			
Apiaries instalment and production						
Land preparation and apiary construction (workforce) - initial	*50 000*	25 000	25 000			
Land preparation and apiary production (materials) - initial	*600 000*	300 000	300 000			
Acquisition of landstroth beehives - initial	*1 632 000*	816 000	816 000			
Acquisition of bee colonies - initial	*288 000*	144 000	144 000			
Acquisition of smokers, suits and other tools - initial	*421 200*	210 600	210 600			
Land preparation and apiary construction (workforce) - coop	*75 000*			25 000	25 000	25 000
Land preparation and apiary production (materials) - coop	*900 000*			300 000	300 000	300 000
Acquisition of landstroth beehives - coop	*2 448 000*			816 000	816 000	816 000
Acquisition of bee colonies - coop	*432 000*			144 000	144 000	144 000
Acquisition of smokers, suits, and other tools - initial	*631 800*			210 600	210 600	210 600
Maintenance and renewal of equipment and infrastructure	-					
Honey processing and packaging						
Honey processing and storage facility construction	*25 000 000*	25 000 000				

Honey processing and storage facility maintenance	*1 680 000*		420 000	420 000	420 000	420 000
Honey processing equipment acquisition	*3 780 000*	3 780 000				
Maintenance and renewal of equipment and infrastructure	-					
Consumables acquisition (beeswax sheets, etc.)	*151 200*	10 080	20 160	30 240	40 320	50 400
Packaging and labelling acquisition	*4 250 000*	150 000	400 000	750 000	1 200 000	1 750 000
Marketing and sales						
Selling point renting	*1 200 000*				1 200 000	
Selling point equipment	*200 000*				200 000	
Transport	*212 500*	7 500	20 000	37 500	60 000	87 500
Signposts and communication	*300 000*	300 000				
Maintenance and renewal of marketing and sales equipment	-					
Workforce requirements	-					
Workforce for apiary maintenance, harvesting and processing	*9 000 000*	600 000	1 200 000	1 800 000	2 400 000	3 000 000
Workforce for marketing and sales	*2 700 000*	300 000	600 000	600 000	600 000	600 000
	-					
	62 089 200	**35 830 680**	**6 105 760**	**5 133 340**	**7 615 920**	**7 403 500**
	23 880 500	**1 067 580**	**2 660 160**	**5 133 340**	**7 615 920**	**7 403 500**

For years 6 to 10:

Cost items	Y6	Y7	Y8	Y9	Y10
Training					
Initial training and start of production (5 days)					
Training of trainers for autonomous production (25 days)					
Training on processing and quality management (2 days)					
Training on marketing and financial management (2 days)					
Training on traceability (1 day)					
Exchange travel with an existing coop (3 days)					
Apiaries instalment and production					
Land preparation and apiary construction (workforce) - initial					
Land preparation and apiary production (materials) - initial					
Acquisition of landstroth beehives - initial					
Acquisition of bee colonies - initial					
Acquisition of smokers, suits and other tools - initial					
Land preparation and apiary construction (workforce) - coop					
Land preparation and apiary production (materials) - coop					
Acquisition of landstroth beehives - coop					
Acquisition of bee colonies - coop					
Acquisition of smokers, suits, and other tools - initial					
Maintenance and renewal of equipment and infrastructure	1 121 700	1 121 700	1 121 700	1 121 700	1 121 700
Honey processing and packaging					
Honey processing and storage facility construction					
Honey processing and storage facility maintenance	420 000	420 000	420 000	420 000	420 000
Honey processing equipment acquisition					

Maintenance and renewal of equipment and infrastructure	567 000	567 000	567 000	567 000	567 000
Consumables acquisition (beeswax sheets, etc.)	50 400	50 400	50 400	50 400	50 400
Packaging and labelling acquisition	2 000 000	2 250 000	2 250 000	2 500 000	2 500 000
Marketing and sales					
Selling point renting					
Selling point equipment					
Transport	100 000	112 500	112 500	125 000	125 000
Signposts and communication					
Maintenance and renewal of marketing and sales equipment	255 000	255 000	255 000	255 000	255 000
Workforce requirements					
Workforce for apiary maintenance, harvesting and processing	3 000 000	3 000 000	3 000 000	3 000 000	3 000 000
Workforce for marketing and sales	600 000	600 000	600 000	600 000	600 000
	8 114 100	**8 376 600**	**8 376 600**	**8 639 100**	**8 639 100**
	8 114 100	**8 376 600**	**8 376 600**	**8 639 100**	**8 639 100**

3.1.4 Total of Costs

Total cost (in RWF)	***62 089 200***	**35 830 680**	**6 105 760**	**5 133 340**	**7 615 920**	**7 403 500**	**8 114 100**	**8 376 600**	**8 376 600**	**8 639 100**	**8 639 100**
Total cost excluding ENABEL support (in RWF)	***23 880 500***	**1 067 580**	**2 660 160**	**5 133 340**	**7 615 920**	**7 403 500**	**8 114 100**	**8 376 600**	**8 376 600**	**8 639 100**	**8 639 100**

3.1.5 Financial analysis

Income on an annual basis and over 10 years

Two main sources of income will be generated by the beekeeping activity:

1. Honey sales, with an estimated price of RWF 5000/Kg, and 50 Kg/beehive per year. This assumption is conservative, if two harvesting seasons are considered. It is assumed that production will start at 20% of this potential and improve gradually to and reach its full capacity after year 7, in order to account for the steep learning curve of beekeeping.

2. Another source of income considered is the honey processing service provided by the CBC to external beekeepers, with a cost of RWF 500/Kg for honey processing.
3. Other sources of income may include visits and tastings in the factory, especially in areas selected for ecotourism development, but have not been included as dependent on the business's evolution and stability over time.

From Y1 to Y5:

Revenue items	***Unit price RWF***	***Comments***	***Y1 to Y5***	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
Honey sales	5 000	Maximum production of 50 Kg/h/y (1 to 2 seasons), progression form 20% to 100% in 9 years	*21 250 000*	750 000	2 000 000	3 750 000	6 000 000	8 750 000
Honey processing fee for external beekeepers/users	500	10 external beekeepers with production of two beehives each per year from Y3, 500rwf/kg for use of processing equipment. Increase of 20% from Y5	*900 000*			300 000	300 000	300 000
		Revenue (in RWF)	***22 150 000***	**750 000**	**2 000 000**	**4 050 000**	**6 300 000**	**9 050 000**

From Y5 to Y10:

Revenue items	***Unit price RWF***	***Comments***	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Honey sales	5 000	Maximum production of 50 Kg/h/y (1 to 2 seasons), progression form 20% to 100% in 9 years	10 000 000	11 250 000	11 250 000	12 500 000	12 500 000
Honey processing fee for external beekeepers/users	500	10 external beekeepers with production of two beehives each per year from Y3, 500rwf/kg for use of processing equipment. Increase of 20% from Y5	360 000	360 000	360 000	360 000	360 000
		Revenue (in RWF)	**10 360 000**	**11 610 000**	**11 610 000**	**12 860 000**	**12 860 000**

Net profit on an annual basis and over 10 years

Net profit is expected to be positive starting Year 5, and then increase on a yearly basis, to reach an average RWF 4,14M / year from Year 9.

From Y1 to Y5::

Net profit	*Y1 to Y5*	Y1	Y2	Y3	Y4	Y5
Net profit (in RWF)	*- 39 939 200*	- 35 080 680	- 4 105 760	- 1 083 340	- 1 315 920	1 646 500
Net profit excluding ENABEL support (in RWF)	*- 1 730 500*	- 317 580	- 660 160	- 1 083 340	- 1 315 920	1 646 500

From Y5 to Y10:

Net profit	Y6	Y7	Y8	Y9	Y10
Net profit (in RWF)	2 245 900	3 233 400	3 233 400	4 220 900	4 220 900
Net profit excluding ENABEL support (in RWF)	2 245 900	3 233 400	3 233 400	4 220 900	4 220 900

Financial results

As per the table below, the IRR of -11.31% suggests that, when considering ENABEL's support, the project is not profitable. However, when ENABEL's support is excluded from the analysis (and therefore focusing exclusively on the benefits and expenses incurred by the cooperative), the IRR is very high, close to 45%. This is very encouraging, considering the conservative assumptions that were made to develop the BP.

Under a similar logic, the negative NPV of -29,128,242 indicates that, including ENABEL's support, the present value of net cash inflows is less than the initial investment outlay. Without ENABEL's support, the NPV becomes positive at 5,272,842. This means that future cash flows are sufficient to recover the initial investments and provide surplus returns.

Discount rate	**12,00%**
Total Internal Revenue Rate (IRR)	**-10,91%**
IRR Excluding ENABEL support	**44,15%**
Net Present Value (NPV)	**-28 480 745**
NPV Excluding ENABEL support	**5 304 549**

Sensitivity parameters

Parameters that may involve changes over induced costs, income and thus financial results can be considered as follow:

- **Sales Variability**: changes in sales volume can impact profitability, as sales may decrease due to market fluctuations, seasonality, or unexpected events.
- **Cost of Goods Sold (COGS):** fluctuations may occur in material costs, labor expenses, and production costs, through price increase.
- **Gross Margin**: changes in gross margin (revenue minus COGS) may affect overall profitability, and external factors (e.g., inflation, currency exchange rates) can impact margins.
- **Operating Expenses**: costs incurred for fixed and variable expenses (e.g., rent, utilities, salaries) may influence net income.
- **Pricing Strategy**: CBCs may want to test different pricing scenarios, as a price increase or decrease may affect demand and revenue.
- **Environmental and Regulatory Risks**: climate-related risks (e.g., weather affecting bee health, unseasonal rains leading to decrease in bee feed, etc.) can have an important impact on production and must be monitored. Compliance with local regulations and permits (RSB standard) also needs to be addressed.
- **Operational Risks:** due to the new implication of CBCs in beekeeping activities, beekeeping-specific risks (e.g., disease outbreaks, modern hive management, etc.) may have a big impact if CBC members have not been well prepared to risk management, or if beehives are being neglected.

3.2 Beekeeping implementation roadmap

3.2.1 General beekeeping roadmap

Title of the project	**Beekeeping value chain development**			
Other participants	RAB, RDB, ICRAF, honey cooperatives, honey companies and distributors			
Objective of the project	Developing a honey production and processing activity managed by the cooperative and locally marketed			
Expected results from the project	R1. The cooperative is trained and equipped on modern beekeeping techniques and practices and able to manage an apiary R2. The cooperative is well organized to manage the activity in administrative, technical, financial and operational terms R3. The cooperative is trained and equipped on honey processing, for an average production of 200Kg of quality honey annually by 2026 R4. The cooperative has the capacity to be certified, assessed, and sell production to a honey purchaser R5. The cooperative can self-sustain after the project to ensure maintenance and operational costs, through solid revolving fund and additional income from processing unit services to other cooperatives and beekeepers			
Steps and actions to be taken	**Time frame**	**Funding source**	**Organizational and technical modalities**	**Implementer**
1/ Structuration and training of CBC members				
Governance & organizational support	Year 1 Q1	ENABEL/ COMBIO	Governance and organizational support will be provided at the initial stage of the project, with the support of ARCOS. This should include determining roles and responsibilities within the cooperative, supporting the decision-making process, and setting up conflict resolution and consensus building mechanisms. It is advised to start this organizational support as early as possible to develop a good understanding of potential bottlenecks and potential conflicts within each CBC. This anticipation will allow a timely implementation of required conflict resolution mechanisms, to avoid internal governance issues. Women's leadership should be supported through dedicated sessions. Other topics should include supporting the empowerment of non-committee CBC members, and training in collective decision making, economic and financial management, and participatory business management methods.	ARCOS

Initial training and start of production (5 days)	Year 1 Q1	ENABEL/ COMBIO	The initial training, undertaken by experimented beekeeper trainers for all members of the CBC, will be held for five days, and will cover the bases of beekeeping production: general understanding on bee life cycle and ecology, apiary instalment (good place to set the beehive, choice of the beehive, surrounding environment, etc.), bee forage and melliferous plants, bee transfer to the beehive, beehive maintenance, threats (pest, diseases, pesticides, etc.) and integrated pest management, honey extraction, general hygiene handling, processing and sales. The training will be practiced through hands-on demonstration (learning by doing) and displayed by a professional beekeeper, preferably part of a successful beekeeping cooperative, in a view to share pragmatic insights.	ENABEL/ICRAF
Training of trainers for autonomous production (25 days)	Year 1 Q2	ENABEL/ COMBIO	This training will be proposed to about 10 highly motivated CBC members, who will then serve as technical referents within their cooperatives. Their ability and will to pass on their knowledge and skills to their fellow CBC members will therefore be a key selection factor. This training should focus on advanced beekeeping practices for sustainable production. Groups of trainees can be mixed between two districts, for ease of logistical facilitation. Curriculum will include (but not exhaustive) the following topics: ▪ **Upscaling Hive Technologies:** Introduction to modern hive designs and technologies; Sustainable practices and climate-smart approaches. ▪ **Bee Forage and Ecosystem Conservation:** Importance of diverse forage plants for bees; Conservation practices to protect natural habitats. ▪ **Housing of Bee Colonies and Types of Housing Technologies:** Different hive types (e.g., Langstroth, top-bar, or Kenyan hives); Proper hive placement and maintenance; Integrated pest management ▪ **Harvesting, Post-Harvest Handling, and Processing:** Techniques for honey extraction; Handling and processing of hive products. ▪ **Integrated Bee Pastures:** Bee forage and bee feed; Creating bee-friendly landscapes; Integrating beekeeping with other agricultural practices. ▪ **Strategic Use of Honeybees for Crop Pollination:** Enhancing crop yields through pollination; Beekeeping as a complementary practice.	ENABEL/ICRAF
Training on processing and quality management (2 days)	Year 1 Q3	ENABEL/ COMBIO	This training focuses on processing techniques from harvest to post-harvest management, hygiene handling, honey processing, storage, packaging, labelling and distribution.	ENABEL/ICRAF

			It will also focus on understanding products requirements, quality and safety impact. A specific point will also be made on principles of food hygiene applicable in the beekeeping chain, following Rwanda Standards Board (RSB) requirements. Equipment and machinery handling and maintenance will also be part of this training. The training will be practiced through demonstration (learning by doing) and displayed by a professional beekeeper, preferably from a successful beekeeping cooperative, in a view to share pragmatic insights.	
Training on marketing and business plan elaboration (2 days)	Year 2 Q1	ENABEL/ COMBIO	Training in marketing and business plan elaboration will allow the CBC to address marketing constraints by evaluating the best and most viable market opportunities, through optimized economic rationale. Topics covered will include: ▪ **Business plan basics**: introduction to BPs and their importance, as well as components of a BK BP ▪ **Market dynamics**: understanding the BK market with demand, trends and competitors, and identifying distribution channels and target customers and their preferences. ▪ **Marketing strategies**: developing effective marketing means for honey products ▪ **Sustainable practices and certification** ▪ **Financial planning and budgeting**: estimating and following costs (hive maintenance, equipment, labor), pricing strategies for honey, and cash flow management	ENABEL/ICRAF
Training on traceability (1 day)	Year 2 Q2	ENABEL/ COMBIO	Training in traceability will allow cooperatives who have succeeded in first harvest and production / sales, as well as those who would want to sell directly to purchasing companies, to go through professionalization of their activity. This module should allow the trainees to support food safety and quality objectives, determine the history or origin of the product and search the cause for non-conformity, facilitate the verification of specific information about the product, and communicate relevant information to stakeholders and consumers.	ENABEL/ICRAF
Exchange travel with an existing coop	Year 2 Q3	ENABEL/ COMBIO	As several beekeeping cooperatives have been supported by former initiatives and have grown through time to find a successfully income generating business, we suggest organizing a visit to more advanced beekeeping cooperative, in a view to get insights from lessons learnt and potential developments.	ENABEL/ICRAF
2/ Apiary instalment - primary production				

Identification & selection of apiaries instalment areas	Year 1 Q1	ENABEL/ COMBIO	In all cases, the CBS site is considered as the first option for apiary instalment. However, if the following conditions are not gathered, then a nearby forest belonging to one of the CBC members or with authorized and safe access can be considered: ▪ Easy accessibility for CBC members ▪ No use of deadly chemicals for bees in the nearby 2-3km ▪ Presence of diverse and numerous melliferous plants and tree species ▪ Flat area within the CBS that can be used for the apiary instalment In some of the CBS, such as in Gatsibo Ryarubamba, the CBS site was not considered proper for beekeeping activity, but an alternative option has been chosen, with a 1,200-ha forest managed by the CBC president (village leader), near the road and far from farming areas. Safety of the hives (from thieves) has been pointed out as a major threat by several CBC, suggesting enrolling a security guard at night (around RWF 40,000 / month), who can be from within the CBC organized through shift rotations.	ENABEL CBC
Land preparation and apiary instalment	Year 1 Q1 Year 2 Q1	ENABEL/ COMBIO	Depending on the chosen site, there may be preparation of the field needed for taking out stones (if rocky site) or flattening. The area (10x3m to 15x5m) should be able to host a structure with 5 beehives for the first year (two structures), and then an additional space for two structures of 5 beehives each in the second year. The expected number of days worked for this exercise may vary depending on the state of the area, but it is estimated to take between 5 and ten working days, and shall be handled by CBC members, except if there is a need for support machinery. After the end of project, from year 3 to year 5, the cooperative is expected to invest in 10 additional beehives yearly.	ENABEL CBC
Selection and purchase of adequate hive models	Year 1 Q1 Year 2 Q1	ENABEL/ COMBIO	Most CBC enquired preference for modern Longstroth beehive, with a preference for pine or cypress because of moisture control. Areas where beehives are built and sold are usually located in Rwamagana or Kigali.	ENABEL
BK equipment acquisition	Year 1 Q1 Year 2 Q1	ENABEL/ COMBIO	Specific equipment, tools and material should be listed (see list in the Appendix 1) and put at the disposal of the CBC, with specific emphasis on their maintenance and sharing purpose.	ENABEL

Input purchase (colony, feed, etc.)	Year 1 Q1 Year 2 Q1	ENABEL/ COMBIO	Other input purchases will include bee colonies, bio pest control tools (if required), and adequate bee feed for off-season complements. It is however expected that CBC members contribute to this exercise by using traditional hives to get bee colonies and proceed to transfer within modern beehives.	ENABEL CBC
Maintenance and renewal of equipment and infrastructure	Year 6 to 10	CBC	Progressive equipment maintenance and renewal should be handled by the CBC, with specific implication from Year 6 for equipment renewal, through dedicated regular budget.	CBC
3/ Honey processing/packaging instalment				
Identification & construction of processing unit	Year 1 Q2	ENABEL	The honey processing and storage unit (25 sqm) will be integrated within the main CBS infrastructure (with CBC office, storage rooms, etc.) qualified as 'Storage and transformation facilities + clean cooking Hub'. It should respect all requirements such as aeration system, electricity access, and clean and safe storage area.	ENABEL
Processing equipment acquisition	Year 1 Q3 Year 2 Q3	ENABEL/ COMBIO	Essential processing equipment (see list in the Appendix 1) should be acquired on Year 1 and Year 2	ENABEL
Processing equipment and infrastructure maintenance and renewal	From Year 6 onwards	CBC	Progressive equipment maintenance and renewal should be handled by the CBC, with specific implication from Year 6 for equipment renewal. Consumables (beeswax sheet, etc.) should also be handled directly by CBC, through dedicated regular budget.	CBC
4/ Marketing and sales				
Selling point renting	Year 4 Q1	CBC	For cooperatives that are not located right by a commercial center with diverse selling opportunities, renting a commercial local in the nearest city/market can be explored, with cost evaluated around RWF 100 000 maximum monthly.	CBC
Selling point equipment	Year 4 Q1	CBC	Small equipment may be needed for the selling point, such as shelves, desk, chairs and different size containers.	CBC
Honey transportation	From Year 1 onwards	CBC	Transportation costs may vary depending on the area's remoteness and agreement with customers or distributor channels. A lumpsum budget by Kg has however been estimated.	CBC

Communication	Year 1 Q3	ENABEL	Road signs and signposts can be an effective way to attract customers by the road and in the surrounding village, which can be easily supported by the project. For more advanced cooperatives after Year 4, it can be considered to promote honey online for customers in bigger city (Kigali), through a dedicated Facebook page for instance.	CBC

3.2.2 Specific modalities for Beekeeping BP implementation by CBS

3.2.2.1 Ngoma Zaza

Selected area for apiary and infrastructures instalment

The CBS in Ngoma Zaza is a long strip of land located on a gentle slope on the banks of a wetland. As a result, the installation of apiaries could be done in a linear way, along the longest edge of the land with easy access to water and neighboring eucalyptus plantations (uphill).

The terrain itself doesn't present any major features that would hinder the instalment of apiaries or processing facilities. The processing facility (and by extension the 'Storage and transformation facilities + clean cooking Hub') of the CBS should be built directly on the site entrance, with direct access to the dirt track connecting the CBS to nearby villages.

Specific considerations and operational recommendations

The Ngoma Zaza CBS is a perfect case study for medium scale BK development, featuring a large CBC with 75 members, of which a small fraction of 12 members have been involved in traditional beekeeping but lack experience with modern beekeeping. The CBC itself appears functional in terms of membership commitment and organization, providing a solid foundation for the implementation of the roadmap.

The risk of theft has not been mentioned during workshops and focus groups on this CBS, but the site is not close to the village and, as it stretches away from the road, some parts can be difficult to monitor. Therefore, it is recommended to start the implementation with caution and directly address the risk of theft with CBC members at the beginning of the project.

As CBS lacks direct access to main roads, potential transportation issues should be addressed early during the project's implementation. CBC members are willing to use their own means of transportation (mainly motorcycles) to bring the honey to markets, but it is likely that other alternatives will be required after a few years of implementation. This issue should be directly discussed with the cooperative.

3.2.2.2 Kirehe Nyankurazo

Selected area for apiary and infrastructures instalment

The CBS site in Nyankurazo is a steep hill with little flat land for infrastructure installation. This poses a constraint for constructing the 'Storage and Transformation Facilities,' including the honey processing facility, and limits the number of apiaries that can be installed. This shouldn't pose a problem in the short term, but the eventuality of installing some beehives outside of the CBS (i.e. on private land belonging to CBC members) should be considered for the continuation of the activity after COMBIO support.

Another constraint is the lack of direct access to the road, which complicates logistics, and the lack of water, which complicates the maintenance of the processing facility, especially for cleaning the equipment. Water storage and rain collection devices should be included in the design of the 'Storage and Transformation Facilities' in this CBS.

On the other hand, the CBS is very close to the main road and the Rusumo border market, meaning that the commercialization of products should not be an issue in the short term.

Specific considerations and operational recommendations:

The Nyankurazo CBC showed a high level of motivation and confidence in developing the BK Value chain, but it is important to keep in mind that the starting point is very low in terms of skills and knowledge, with only one active traditional beekeeper in the cooperative. A strong emphasis should be placed on initial training.

Other recommendations are the following :

1. Address the lack of direct road access early in the project to ensure efficient logistics (e.g. by securing access rights with neighboring landowners).
2. Include water storage and rain collection devices in the design of the 'Storage and Transformation Facilities' to manage the water supply for the honey processing facility.
3. Leverage the proximity to the main road and Rusumo border market to facilitate the commercialization of products in the short term.

4. Place a strong emphasis on initial training due to the low starting point in terms of skills and knowledge, with only one active traditional beekeeper in the cooperative.

3.2.2.3 Rwamagana Murambi

Selected area for apiary and infrastructures instalment

The site's location in the shors of the lake and general environment remain favorable to the pilot development of a beekeeping activity. The area for apiary installment should be discussed with the cooperative members in order to maximize the potential (melliferous trees) and minimize the security threats for people.

Specific considerations and operational recommendations:

The Rwaagana Murambi CBC showed a high level of motivation and confidence in developing the BK Value chain, but it is important to keep in mind that the starting point is very low in terms of skills and knowledge, with no beekeepers in the cooperative. A strong emphasis should be placed on initial training and follow up of the activity.

3.2.2.4 Gatsibo Ryarubamba (Rubona)

Selected area for apiary and infrastructures instalment

The current CBS site is not adequate for beekeeping, as it is an open land field mainly surrounded by agricultural fields with cassava, potato and vegetable cultivation, with high risk of pesticide exposure for bees. Even though the CBS site has benefited from initial stages of native tree plantation thanks to ENABEL support, proximity to schools and pathway as well as pesticide exposure led to not retaining the CBS site location for beekeeping.

Another site had found to be more ideally located to host beekeeping activity, a nearby 1,200ha forest managed by the village leader (also CBC's president) with wide number of eucalyptus trees. Given the availability of feed stock, low to zero risk of pesticide exposure, and logistical ease (proximity to village, belonging to CBC's president), this place was retained for the activity.

Specific considerations and operational recommendations:

1. Distance from beehives to processing unit (on the CBS) needs to be addressed with specific transportation and post-harvest storage.
2. As a specific location for apiaries has been selected by the CBC near an accessible pathway crossing the forest, the area is quite remote and to avoid any risk of theft, the CBC will need to organize shifts to safekeeping beehives and honey production.
3. There are currently no beekeepers within the CBC, so no access to traditional hives (that may help to attract bee colonies for transfer to modern hives) but has committed to start installing traditional hives before the activity start or identifying external beekeepers.
4. Marketing and sales channels will be easy to access, as per the wide local demand in the village (low number of beekeepers around), through local selling points, and two nearby markets.
5. Other opportunities for lower quality honey can be through beer manufacturers that are located around the Sanctum.
6. Specific point of attention regarding group inertia, due to the wide number of members in the CBC, and strong hierarchical structure, as well as village leader being the CBC's president (and can take over during discussion).

3.2.2.5 Nyagatare Karushuga

Selected area for apiary and infrastructures instalment

The current CBS site is ideally located for beekeeping activity development, through the Karushuga forest access with a wide and diverse feed stock. The proposed area for apiary is rocky and will need 5-6 working days of few CBC members for preparation of the field.

However, nearby banana, vegetable and cassava farming activities with high pesticide exposure risk can pose a threat to bees who would go outside the forest, especially proximity with Gabiro Agribusiness Hub and its consequent vegetable monoculture lands. Regarding local farmer fields, specific sensitization sessions should be given to advise night spraying, and reduced use of deadly chemicals to bees. Discussion can also be facilitated between ENABEL project officers and Gabiro Hub, to understand if usage of deadly chemicals to bees (such as 'Rocket') is frequent.

Before the end of the ENABEL's support, local authorities should be consulted in a view to seek advancement of expected construction of Tanzania border, make sure it would not disrupt apiaries, or help the CBC put in place adaptative measures.

Specific considerations and operational recommendations:

1. The existing cooperative (KOTEKA) in the village that employes at least 10 members of the CBC, and was planned to be cancelled, will finally remain because of subsidies relaunch from FAO project (attribution of 20 hives). It is allowed by the sector for members to work in both cooperatives, but to mitigate potential conflict of interest, management from both cooperatives have to stay separate (committee members cannot be the same). The last may need some reshuffle.
2. There are however potential synergies between the two cooperatives, especially potential for KOTEKA to sell honey to CBC.
3. The village leader's (also president of KOTEKA) implication in CBC's decisions should remain limited, but support as advisor on beekeeping and on field training is advised.
4. Potential disequilibrium between CBC members part of KOTEKA (trained and knowledgeable about beekeeping) and other CBC members may arise and should be addressed by equally strengthening capacities of new members.
5. Currently, there are 100 traditional beehives within the village with 12 bee colonies, and other hives are waiting for colonies. CBC members are confident in getting several more colonies by summer, to be ready for colony transfer to modern hives when the activity will start.
6. Due to the higher level of the current CBC in beekeeping and higher potential success, the project can be confident to start with increased number of beehives.
7. Marketing and selling channels are more limited in Nyagatare Karushuga but putting roadsigns (proximity to Gabiro and other projects) and selling through village shops.

4 Ecotourism business plan and roadmap

4.1 Ecotourism business plan

Context

Throughout the study, it became apparent that the cooperatives formed within the CBS framework and their members lack the basic skills and capacities to initiate a viable ecotourism activity. Indeed, most cooperative members speak neither English nor French, and have little or no knowledge of the expectations, needs and standards of national and international tourism. It should also be borne in mind that the cooperatives are new, and do not have a sufficiently solid organizational and governance structure for the short-term development of a tourism business.

Also, international tourism in Rwanda is largely dominated by remarkable attractions, in particular visits to the National Parks (Nyungwe, Akagera, Volcano, Gishwati-Mukura, etc.) and certain memorial sites linked to the 1994 genocide.

In Rwanda, there are some tourism initiatives which don't rely on national parks. The examples are Ibere rya Bigogwe, Beyond the Gorillas Experience, Kirehe Tourism Experience, Nyungwe EcoVillage Tourism Activities, Lake Kivu Tourism, etc. CBCs can build on those experiences and be capable to valorize the resources in Eastern Province.

It is therefore advisable to be particularly cautious and modest when developing this value chain. Without a private partner or specialized NGO, it is unlikely that cooperatives can be supported to develop a profitable and sustainable tourism business.

However, in response to ENABEL's requests for further information, we will be putting forward proposals for tourism products, a roadmap and financial simulations

The general objective

The general objective of this business is to increase income and livelihood of cooperative members through community-based ecotourism and local product development and promotion. This objective could be achieved through the implementation of the following specific activities:

- Definition of a tourism product catalog (services and products)

- Small investments for the tourism development of the CBS.

- Seeking potential private partners or NGOs specialized in tourism.

- Negotiate and contract with a private partner or NGO for the tourism development of the CBS.

Business plan description

In the case of CBS with ecotourism potential, the business plan could take 2 more or less ambitious forms:

- **The first would involve setting up a small store run by the cooperative or a private manager**, to sell natural products from the CBS or other CBSs (honey, dried medicinal plants, essential oils, etc.) as well as drinks and small snacks. The project would consist of a rest and walking area within the CBS, with the possibility of discovering native plants and their uses. In this case, the cooperative will require substantial capacity-building, as well as technical assistance in marketing and revenue management.
- **The second approach would be more ambitious, based on a potential investment by a private individual or NGO to develop an innovative ecotourism concept around the CBS and their environment.** Potential projects would depend on the investment capacity of the partners, their vision, their market research and the opportunities afforded by the RFA and negotiated with the cooperatives. They could include eco-friendly accommodation with a range of catering services and nature activities such as bike rides, boat trips and guided tours of the area.

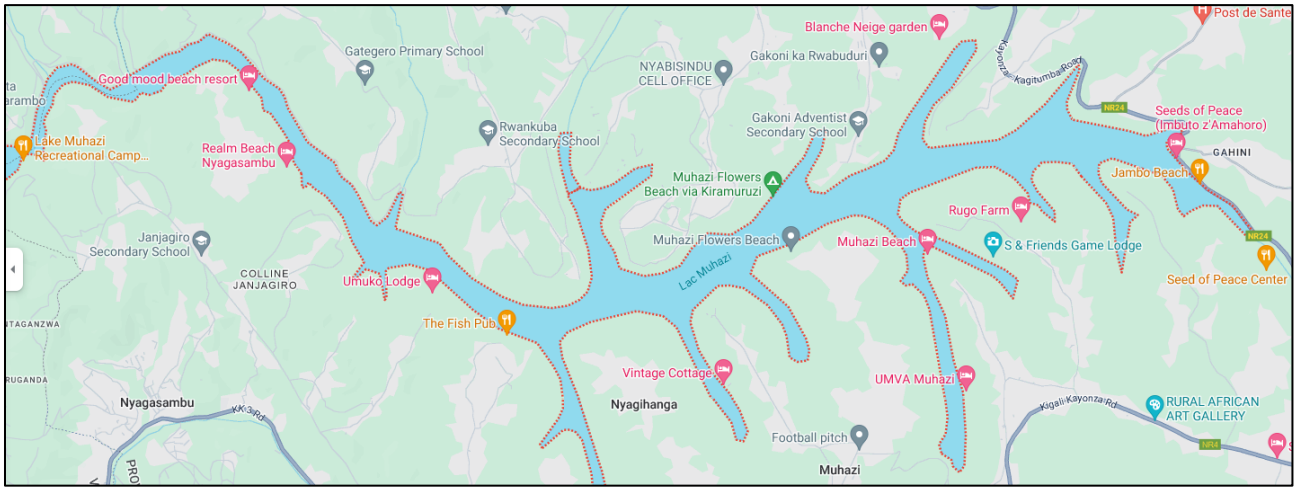
4.1.1 Market analysis and forecasted business growth

Demand analysis

In terms of potential market demand, we identify two main targets for Gahini CBS situated in Kayonza along Jambo Beach and two others for the Nyankurazo-Rusumo CBS in Kirehe.

For Gahini CBS

- **International and domestic (usually from Kigali) tourists with high purchasing power** who visit or return from Akagera National Park. Some make the visit as a day trip from Kigali, while others stay in or near the National Park in lodges. These tourists are generally just passing through on the road but might consider a 15-minute to 1-hour stop at a CBS if the offer met their expectations and provided something new compared to other sites visited.
- **Domestic tourists who spend a weekend or a few days on vacation around Lake Muhazi** to relax, be with family, as a couple, or with friends. They usually stay in one of the many existing hotels or campsites around Lake Muhazi. In these establishments, they typically find all the necessary services and opportunities for boat trips on the lake.



For Nyankurazo CBS

- **International tourists would mainly be linked to the border crossing at Rusumo.** Truck drivers passing through customs can typically spend several days at the border, staying at some of the local hotels. This kind of tourists are likely to explore any type of local attractions, but they probably won't spend a lot of money on such activities
- **National tourists would most likely be people residing in the district,** but interested in visiting the Rusumo falls and hydroelectric plant, and to take advantage of the beautiful view offered by the CBS on Akagera river. Another category of visitors could be the local youngsters wishing to ascend the Ibere ry'inkumi e.g. to take pictures for social media. In any case, local visitors are not likely to spend much on the site.

The *Nyankurazo* CBS is still very isolated and relatively far from the main tourist circuits in the east, particularly for travellers to and from Akagera NP. The lack of direct road access and parking makes it difficult for an external investor to set up directly in the CBS. Consequently, although the site has potential, it is proposed to prioritize investments and activities in the other CBS of Gahini.

Strategy to grow the business in Gahini CBS:

Considering the existing competitive tourist offerings both around Lake Muhazi and near Akagera National Park, **any ambitious development strategy for an ecotourism business should include a partnership with a private entity or a specialized NGO.** The approach and vision for the project to be developed would then depend on the partner, their financial capabilities, and negotiations with the RFA, local authorities, and the cooperative.

Nonetheless, we can outline below some of the key elements in the development of this business. First of all, it will be needed to develop touristic products and services, make the basic invests and create the right conditions and organization at the cooperative level for the production and supply of services, and finally communicate to attract customers.

Main tourist products available for Gahini CBS:

- **Natural products for sale derived from other value chains and others:** honey and its derivatives, medicinal plants, essential oils, wild fruits, native plants, etc. Possibility of promoting traditional local crafts.
- **Self-guided or guided tours of the CBS** to discover the botanical wealth and local fauna of the site, as well as the views over Lake Muhazi. Discovery and/or education circuits in the CBS and its botanical garden.
- **Guided or self-guided bike tours around the lake and in the surrounding rural areas and communities.** Community and cultural tourism can be combined with visits to agricultural and livestock farms, dances, etc.
- **Guided boat tours on Lake Muhazi** to observe birdlife, practice recreational fishing and take in the surrounding scenery. Possibility of visiting the Murambi CBS from Gahini.

This tourism offer should be discussed in greater detail with the cooperative and potential private partners or NGO, including professional tour operators working in Akagera NP area.

Potential partners

We identify 3 main categories of partners that could be contacted for potential partnership :

- **The Jambo beach restaurant and/or the Seeds of peace center**, that are local businesses very close to the CBS (less than 500 m) and already operating in tourism with specific offers of accommodation, food, drinks and traditional ceremonies (local milk). These partners should be contacted first to avoid potentially hostile competition, and to encourage cooperation and complementarity between the CBS and these existing facilities. In particular, it is possible to offer CBS products (medicinal plants, essential oils, etc.) for sale at these sites, and conversely to welcome customers from these sites to the CBS for botanical and environmental visits.
- **Others private investors or specialized NGOs in ecotourism** (such as BIOCOOR, Rwanda Wildlife Association, Forest of Hope Association, Red Rocks Initiative For Sustainable Development, Nature Rwanda, etc.). This category of partners must be able to propose an eco-compatible project and a profitable investment plan to enhance the CBS in the eco-tourism sector, creating jobs and income for the community and the cooperative. In this case, the operator provides the know-how, investment capacity, specialized human resources and contacts needed to attract tourists. Unfortunately, the cooperative will have little to offer apart from a permit to access and use the CBS, low-skilled labor, CBS products and possibly cultural visits to the village of Gahini. With ENABEL's facilitation, a tripartite agreement between the cooperative, the investor and the RFA should establish the terms of cooperation and the sharing of revenues from the commercial exploitation of the site.
- **Tour operators** (such as Wilson Tours, Africa journeys, Eagle ride, Attractive safaris, Birding and educational tours, responsible travel Africa, destination Rwanda, Fine safaris Afrika, Rwanda eco-company and safaris, etc.). This third category of stakeholders has access to many customers visiting Rwanda, and Akagera NP in particular. After defining a tourism product offering in the CBS and setting up an operational structure (preferably with a partner), tour operators could be contacted to discuss the terms and conditions for arranging stops at the CBS for groups travelling to or from Akagera NP. Tour operators are likely to negotiate a commission on attractions and products sold to “their” tourists.

4.1.2 Breakdown of investments

Possible investments for COMBIO project

In the absence of a tourism partnership with an operator, it is advisable to remain modest in terms of investments for this activity. However, in Kirehe Nyankurazo and Gahini, the following investments can be considered:

- **Improvement of walking trails** to facilitate visits in the CBS. The cooperatives suggest paved trails, but the cost seems prohibitive to us, around 50,000 RWF/m², or 5 million RWF for just 100 linear meters. We recommend instead regular maintenance of the existing trails, with the addition of sand or gravel if necessary (around 10,000 RWF/m).
- **A small store for selling products and welcoming visitors.** Approximately 6-7 million RWF for construction, plus 2 to 4 million RWF for finishing and equipment. This should be considered alongside the broader infrastructure to be built for other value chains. It's crucial that the store is easily visible from the road and accessible.
- **Benches and tables for picnics and rest within the CBS.** Preferably in shaded areas and in a location that is easy to maintain to prevent weed growth. Around 300 000 RWF per unit.
- **Large roadside sign for the CBS**, identifying products for sale and services offered. Preferably to be discussed with a potential operator to ensure alignment between the signage and the actual offerings. Around 1 to 1,5 million RWF.

In addition, we propose two additional investments for specific touristic products :

- **A small boat** with motor and equipment, in order to offer boat rides on the lake. Thus, Gahini in Kayonza and Murambi in Rwamagana can be connected by boat and bring more opportunities for people visiting Gahini to discover he Murambi CBS as well. The 2 cooperatives will sign the MoU as each cooperative has the autonomy in management. It has to be noted that Jumbo Beach restaurant and Seeds of peace center already have boats and propose tours to their customers.
- **10 mountain bikes** and equipment, in order to offer bikes rides and tours around the lake and in the surrounding communities.

The estimated global amount for these initial investments is around 35 to 40 million RWF (around 25,000 euros).

There are numerous other potential investments, but they largely depend on the project and the capabilities of the private partner or NGO. These could include the following potential investments: traditional huts or wooden houses with showers and toilets, camping areas, restaurant-bars, all-terrain electric scooters, a platform on the lake, etc. The CBS also can target the local schools and Universities and get the money related to conservation education, internship, and research.

In addition, to optimize project formulation, the cooperative's internal organization and negotiations with potential partners, we recommend recruiting a national expert in community tourism and ecotourism to build the capacity of cooperative members and provide them with pearled technical assistance over 6 to 12 months. We also recommend a consultant who can help in marketing the CBS by creating a strong website with maps, and great pictures of the CBS. The consultant can also register the CBS on online tourism and travel platforms and on social media to increase their visibility. **This external support could cost between 15 and 25 million Rwandan francs.**

After that, it is important to include functional costs that would be necessary for running the business.

At the very least, and assuming a modest approach, we recommend budgeting for a full-time reception and sales person (the position could be shared between several people depending on their availability), 2 guides who would intervene on an ad hoc basis and on request, and lump-sum budgets for maintenance and miscellaneous operations. **These functional costs could amount to 6 to 7 million RWF per year.**

The tables below detail the proposed investments.

Initial investment

Cost items	Unit cost RWF	Number of item/unit	Source	Comments	Y1 to Y5	Y1	Y2	Y3	Y4	Y5
Initial investment					**53 000 000**	**39 000 000**	**-**	**5 500 000**	**2 000 000**	**6 500 000**
Improvement of existing trails with sand and gravels	25 000	200	local	Improvement of 200 m every 2 years until 600 m in year 5.	15 000 000	5 000 000		5 000 000		5 000 000
Botanical garden improvements and educational plant and animal panels	2 000 000	1	Estimates	First investment in Y1 + supplements and maintenance every 2 years	3 000 000	2 000 000		500 000		500 000
Small store for selling products and welcoming visitors (infrastructure and equipments)	17 000 000	1	Local	Should be considered alongside the broader infrastructure to be built for other value chains. It's crucial that the store is easily visible from the road and accessible. Maintenance and new equipment every 4 years.	19 000 000	17 000 000			2 000 000	
Benches and tables for picnics and rest	300 000	10	Local	10 benches and tables along the trails, in the open areas of the CBS. Maintenance every 5 years.	4 000 000	3 000 000				1 000 000
Small boat, motor and equipment	5 000 000	1		Optional : Jumbo beach restaurant and Tree seed center already offer this attraction. Replacement of motor and maintenance after 6 years.	5 000 000	5 000 000				
10 montain bykes and equipment	550 000	10		Optional : Depending on specific tours and demand. To be replaced after 5-6 years.	5 500 000	5 500 000				
Large roadside sign for the CBS	1 500 000	1	Estimates	To be designed carrefuly taking into account to partners and different kind of tourists. To be replaced afer 5-6 years	1 500 000	1 500 000				

Training and technical assistance

Cost items	Unit cost RWF	Number of item/unit	Source	Comments	Y1 to Y5	Y1	Y2	Y3	Y4	Y5
Training and technical assistance					**25 500 000**	**10 500 000**	**12 500 000**	**-**	**-**	**2 500 000**
Cooperative members capacity building in ecotourism	2 500 000	2	estimates	National expert in community based tourism and ecotourism. Fees of the expert, transport and training costs with 10 to 15 selected members for 2 to 3 days.	7 500 000	2 500 000	2 500 000			2 500 000
Technical assistance for project design, marketing, propecting and negociations with partners	8 000 000	2	Estimates	National expert in community based tourism and ecotourism recruited to provide specific technical assistance to the project and cooperative to design the project, prospect potential partners and support the negociation process.	16 000 000	8 000 000	8 000 000			
Exchange travel with an existing coop (3 to 5 days)	2 000 000	1	Estimates	Includes accomodation and transport + 2,500/day for 10 persons	2 000 000		2 000 000			

Functional costs

Cost items	Unit cost RWF	Number of item/unit	Source	Comments	Y1 to Y5	Y1	Y2	Y3	Y4	Y5
Functionnal costs					**48 150 000**	**8 025 000**	**8 025 000**	**8 025 000**	**8 025 000**	**16 050 000**
1 permanent reception and sales staff, per month (Basic english needed)	350 000	12	5 to 6 days/week	If possible, recruited in the community and trained. Doubled after 5 years and tripled after 8 years in case of success.	25 200 000	4 200 000	4 200 000	4 200 000	4 200 000	8 400 000
2 local guides for specific visits in the CBS	8 000	100	Estimates	8 000 RWF/visit payed to the guide. Around 100 payed visits per year. Doubled after 5 years and tripled after 8 years in case of success.	4 800 000	800 000	800 000	800 000	800 000	1 600 000
Daily workers for trails in the CBS, botanical garden and store maintenance	2 500	250	Estimates	250 days of work for maintenance. Doubled after 5 years and tripled after 8 years in case of success.	3 750 000	625 000	625 000	625 000	625 000	1 250 000
Other functionnal costs	200 000	12		Doubled after 5 years and tripled after 8 years in case of success.	14 400 000	2 400 000	2 400 000	2 400 000	2 400 000	4 800 000

4.1.3 Financial analysis

For this value chain, it is particularly difficult to detail financial analyses. It appears that any project managed locally by the cooperative would primarily involve selling products from other value chains. But it is not possible here to calculate precisely the cost price, the selling price to the consumer and to estimate sales volumes for each type of product from the CBS. The key challenge here would therefore be to facilitate the sale of natural products from other value chains to potential customers and tourists. The revenues from these sales are indirectly integrated into each value chain business plan.We can still conduct some simulations to estimate potential revenues based on visitor numbers and approximate spending levels.

- **Minimal option**: Assuming the CBS receives an average of 2 visitors per day for 300 days (600 visitors per year) who spend an average of 15,000 RWF each, the approximate annual revenue could be around 9 million RWF.
- **Intermediate option**: Assuming the CBS receives an average of 5 visitors per day for 300 days (1,500 visitors per year) who spend an average of 30,000 RWF each, the approximate annual revenue could be around 45 million RWF.
- **High option**: Assuming the CBS receives an average of 7 visitors per day for 300 days (2,100 visitors per year) who spend an average of 50,000 RWF each, the approximate annual revenue could be around 105 million RWF.

Taking these assumptions into account, and with a view to integrating gradual business growth, we propose to model a trend increase in visitor numbers and spending over the next ten years.

First of all, in the first year, revenues are likely to be nil or negligible due to lack of supply and clientele. It is therefore preferable to anticipate a significant deficit.

Then, once the investments have been made and the practical arrangements implemented, it is possible to anticipate modest revenues of around 9 million RWF from year 2, growing by 30% a year for 3 years.

After 4 years, with the diversification of the product offer, the professionalization of the players and the increase in the number of annual visitors, revenues could rise to around 45 million RWF per year, growing by 20% per annum.

Finally, assuming the project is a real success, revenues could rise sharply after 7 to 8 years, to over 100 million RWF per year. In this scenario, costs would also increase, although this is difficult to estimate.

These financial simulations are presented in the table below :

Revenue items	*Unit price RWF*		*Source*	*Comments*	*Y1 to Y5*	Y1	Y2	Y3	Y4	Y5
Low tourism hypothesis	***15 000***	***600***	Estimates	Average of 2 visitors per day for 300 days (600 visitors per year) who spend an average of 15,000 RWF each. +30% per year deuring 2 years.	***35 910 000***		**9 000 000**	**11 700 000**	**15 210 000**	
Medium tourism hypothesis	***30 000***	***1 500***	Estimates	Average of 5 visitors per day for 300 days (1,500 visitors per year) who spend an average of 30,000 RWF each. +20% per year during 2 years.	***45 000 000***					**45 000 000**
High tourisme hypothesis	***50 000***	***2 100***	Estimates	Average of 7 visitors per day for 300 days (2,100 visitors per year) who spend an average of 50,000 RWF each	**-**					
				Revenue (in RWF)		**-**	**9 000 000**	**11 700 000**	**15 210 000**	**45 000 000**

Revenue items	*Unit price RWF*		*Source*	*Comments*	Y6	Y7	Y8	Y9	Y10
Low tourism hypothesis	***15 000***	***600***	Estimates	Average of 2 visitors per day for 300 days (600 visitors per year) who spend an average of 15,000 RWF each. +30% per year deuring 2 years.					
Medium tourism hypothesis	***30 000***	***1 500***	Estimates	Average of 5 visitors per day for 300 days (1,500 visitors per year) who spend an average of 30,000 RWF each. +20% per year during 2 years.	**54 000 000**	**64 800 000**			
High tourisme hypothesis	***50 000***	***2 100***	Estimates	Average of 7 visitors per day for 300 days (2,100 visitors per year) who spend an average of 50,000 RWF each			**105 000 000**	**105 000 000**	**105 000 000**
				Revenue (in RWF)	**54 000 000**	**64 800 000**	**105 000 000**	**105 000 000**	**105 000 000**

Financial results

Taking into account the necessary investments, external support costs and estimated annual operating costs, it appears that the first three years will undoubtedly be loss-making, particularly due to initial investments and support costs.

From the fourth year onwards, a small net margin could be generated, but it would only be from the fifth and sixth years onwards that the net margin would become interesting.

Then, from the eighth year onwards, if the project is a success and the clientele is good, the average annual net margin could be around 80 million RWF (excluding the cost of products sold (medicinal plants, essential oils, etc.).

The table below shows a 10-year simulation of the possible evolution of expenses, revenues and therefore net margin.

Cost items	Unit cost RWF	Number of item/unit	Source	Comments	Y1 to Y5	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Initial investment					53 000 000	39 000 000	-	5 500 000	2 000 000	6 500 000	9 000 000	2 500 000	-	1 500 000	2 000 000
Training and technical assistance					25 500 000	10 500 000	12 500 000	-	-	2 500 000	-	-	-	-	-
Functionnal costs					48 150 000	8 025 000	8 025 000	8 025 000	8 025 000	16 050 000	16 050 000	16 050 000	24 075 000	24 075 000	24 075 000
				Cost (in RWF)	126 650 000	57 525 000	20 525 000	13 525 000	10 025 000	25 050 000	25 050 000	18 550 000	24 075 000	25 575 000	26 075 000

Revenue items	Unit price RWF		Source	Comments	Y1 to Y5	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Low tourism hypothesis	*15 000*	*600*	Estimates	Average of 2 visitors per day for 300 days (600 visitors per year) who spend an average of 15,000 RWF each. +30% per year deuring 2 years.	*35 910 000*		9 000 000	11 700 000	15 210 000						
Medium tourism hypothesis	*30 000*	*1 500*	Estimates	Average of 5 visitors per day for 300 days (1,500 visitors per year) who spend an average of 30,000 RWF each. +20% per year during 2 years.	*45 000 000*					45 000 000	54 000 000	64 800 000			
High tourisme hypothesis	*50 000*	*2 100*	Estimates	Average of 7 visitors per day for 300 days (2,100 visitors per year) who spend an average of 50,000 RWF each	-								105 000 000	105 000 000	105 000 000
				Revenue (in RWF)		-	9 000 000	11 700 000	15 210 000	45 000 000	54 000 000	64 800 000	105 000 000	105 000 000	105 000 000
				Net margin (in RWF)	-	57 525 000	- 11 525 000	- 1 825 000	5 185 000	19 950 000	28 950 000	46 250 000	80 925 000	79 425 000	78 925 000

Conclusion

For this value chain, in the absence of a negotiated partnership with a private company or NGO at this stage, it remains difficult to estimate the scope of the future ecotourism project on the Gahini CBS. However, simulations have shown that with an initial investment (years 1 and 2) of between 50 and 80 million RWF, it is possible to lay the foundations for a profitable project. Indeed, if favorable conditions are put in place to develop an attractive range of tourism products and services, if a professional partner is found, and if tourism continues to grow in Rwanda, it is conceivable to generate initial profits after 3 to 4 years, and to consolidate a successful and profitable project in 5 to 6 years. While the initial investments made by the COMBIO project are strategic, the dynamics and organization of the cooperative, as well as the negotiation of balanced and serious partnerships, will also be key to the project's success.

4.2 Ecotourism implementation roadmap

The ecotourism implementation roadmap includes 3 complementary steps details below and in the table :

1/ Structuration and training of CBC members.

Cooperative members lack basic knowledge of ecotourism and the sector's potential and requirements. They could therefore benefit from basic training in this field, exchange visits with community tourism projects and specific technical support for the design of their project. Cooperatives should be supported to get the legal personality.

2/ Small investments for the tourism development of the CBS.

To improve the site's situation, small improvements could be funded in connection with investments in other value chains. These could include the purchase and installation of a signboard, the installation of species identification panels in the botanical garden, the purchase and installation of tables and benches, and the equipping of a "small store" section in the buildings that will be constructed for the cooperative in connection with the development of other sectors.

3/ Seeking potential private partners or NGOs specialized in tourism.

At this stage, it seems that the roadmap should primarily focus on finding a potential partner for the tourism development of the CBS. This search can be facilitated by ENABEL, the RFA, and local authorities. The key is to identify a potential investor and manager who is open to cooperating with the local community represented by the cooperative, which is currently being consolidated.

At this stage, 3 categories of potential partners are identified :

- The Jambo beach restaurant and/or the Seeds of peace center, that are local businesses very close to the CBS (less than 500 m) and already operating in tourism in the area.
- Others private investors or specialized NGOs in ecotourism : BIOCOOR, Rwanda Wildlife Association, Forest of Hope Association, Red Rocks Initiative For Sustainable Development, Nature Rwanda, The Green Protectors, REDO, ARECO Rwanda Nziza, etc.
- Tour operators : Wilson Tours, Africa journeys, Nyungwe EcoVillage, Eagle ride, Attractive safaris, Birding and educational tours, responsible travel Africa, destination Rwanda, Fine safaris Afrika, Inzozi Africa, Rwanda eco-company and safaris, The Beyond Gorillas Association, NAC Rwanda, Akagera Management Company, etc.

Title of the project	**Ecotourism value chain development in Gahini CBS**			
Other participants	RDB, RFA, private companies or specialized NGOs operating in tourism			
Objective of the project	Developing an ecotourism project that provide jobs and revenues to the CBS cooperative and local community			
Expected results from the project	R1. The cooperative members are trained and supported in the development of their ecotourism project, including assessment of the needs, investments and product and services offer. R2. The initial investments for the project are done, the facilities are built and the equipment bought R3. The cooperative and its institutional partners conduct a prospection and negotiation process with potential partners. R4. The ecotourism project is fully operational with a strong partnership between the cooperative and a professional operator. R5. RDB is involved in the regulatory process to ensure the quality of services R6. REMA is involved to facilitate and be flexible so that the environmentally friendly infrastructures around the Lake Muhazi get the permits			
Steps and actions to be taken	**Time frame**	**Funding source**	**Organizational and technical modalities**	**Implementer**
1/ Structuration and training of CBC members				
Governance & organizational support	Year 1 Q1	ENABEL /COMBIO	Governance and organizational support will be provided at the initial stage of the project, with the support of ARCOS. This should include determining roles and responsibilities within the cooperative, supporting the decision-making process, and setting up conflict resolution and consensus building mechanisms. It is advised to start this organizational support as early as possible to develop a good understanding of potential bottlenecks and potential conflicts within each CBC. This anticipation will allow a timely implementation of required conflict resolution mechanisms, to avoid internal governance issues. Women's leadership should be supported through dedicated sessions.	ARCOS

			Other topics should include supporting the empowerment of non-committee CBC members, and training in collective decision making, economic and financial management, and participatory business management methods.	
Initial training on ecotourism (5 days)	Year 1 Q1	ENABEL /COMBIO	The initial training, undertaken by experimented ecotourism national expert for 10 to 15 members of the CBC, will be held for 2 to 3 days, and will cover the bases of community-based tourism, ecotourism, environmental protection, marketing products, price definition, etc.	ENABEL/ICRAF
Exchange travel with an existing community-based tourism project	Year 2 Q3	ENABEL /COMBIO	As several community-based tourism projects have been supported by former initiatives and have grown through time to find a successfully income generating business, we suggest organizing a visit to more advanced communities, in a view to get insights from lessons learnt and potential developments.	ENABEL
2/ Initial investments in facilities and equipment				
Identification & selection of initial investments	Year 1 Q1	ENABEL /COMBIO	Based on the proposal of this report, the cooperative, ENABEL, the RFA and local authorities will work together with the support of an expert in ecotourism to design the project and assess the priority investments need to start.	ENABEL, RFA, local authorities, CBC
Facilities construction and equipment purchasing	Year 1 Q1 Year 2 Q1	ENABEL /COMBIO	REMA should be involved to facilitate the permits for environmentally friendly infrastructures around the Lake Muhazi. Specific equipment, tools and material should be purchased according to ENABEL procedures. They will be installed in the CBS with specific emphasis on their maintenance and sharing purpose.	ENABEL
Technical assistance in online marketing	Year 2 Q2-Q3	ENABEL /COMBIO	A consultant will be recruited to support in marketing the CBS by creating a strong website with maps, and great pictures of the CBS. The consultant can also register the CBS on online tourism and travel platforms and on social media to increase their visibility	ENABEL
Maintenance and renewal of equipment and infrastructure	Year 6 to 10	CBC	Progressive equipment maintenance and renewal should be handled by the CBC, with specific implication from Year 6 for equipment renewal, through dedicated regular budget.	CBC
3/ Prospection and negotiation with possible partners				

Identification of interested partners	Year 1 Q2	ENABEL	ENABEL and its partners will make a short presentation of the area and the possible ecotourism project that need a partner. This presentation will be shared with several potential candidates. The private companies and NGOS will have to send their expression of interest in ordre to be considered in a list of potential partners.	ENABEL / CBC
Negotiations with partners	Year 1 Q3-Q4	ENABEL /COMBIO + partner	Based on the expression of interest of potential partners, a shortlist will be made to start initial negotiations and discussions with the entities. Their potential will be assessed based on their experience and skills in the sector, their idea of project, their capacity of investment and the way of engaging and associating the cooperative members. Finaly, the financial conditions regarding the sharing of the revenues with the cooperative will be considered.	ENABEL
Signature of an agreement	Year 2 Q1	Partner	Signature of a partnership agreement between the cooperative, a private or NGO operator and possibly the RFA.	CBC / partner / RFA

5 Tree seeds and seedlings business plan and roadmap

5.1 Tree seeds and seedlings business plan

The general objective

The general objective of this business is to increase income and livelihood of cooperative members through collection of tree seeds and production of seedlings. This objective will be achieved through the implementation of the following specific activities:

1. Structuration and training of CBC members
2. Nursery instalment (reinforcement or construction)
3. Tree seeds collection and preparation
4. Seedling production
5. Commercialization, marketing and sales

Business plan description

Due to the new nature of the cooperative, very few members involved in commercial nursery activity, and the general new nature of this activity (native plant and tree nursery), there is little room for variable basis scenario, as nursery activity development must follow specific steps regardless of each location, number of members, etc.

The general scenario allows for a comprehensive and progressive autonomous development of the TSS nursery activity for the community biodiversity cooperatives (CBC), after almost a year of support from ENABEL for the first production and dissemination / plantation trial. The project is expected to provide continuous support to CBCs through training, nursery instalment or strengthening, equipping and functioning, tree seeds collection and preparation, seedling production, and sales.

Most of the existing and new CBS nurseries will continue to operate for 2,5 years (2024-2026) under COMBIO supervision and support. During this period, the nursery activity will remain focused on the COMBIO project objectives and priorities. Then, the seedlings produced in the nurseries will be mainly used for CBS restoration and shared (for free) with partners such as RFA and other projects, for public lands restoration. This activity will be financed by COMBIO and cannot be considered in the Business plan of the cooperative.

During these 2,5 years, the cooperative must be trained and organized to become more self-sufficient and able to start a commercial activity. In that perspective, the cooperative should be allowed to bid for public tenders, prospect for markets and sell between 10 and 30% of the seedlings produced during the next 2,5 years. If the cooperative obtains a significant public market, it must be allowed to use a part of the nursery for this contract, even before the end of the project.

The cooperative must also be supported and empowered in their native seeds collection and processing capacity, as well as reaching a good understanding of National Tree Seed centre certification requirements. Cooperatives must at least secure the provision of specific native plant seeds to sustain the sancta's seedling production, for CBC that do not have access to these species.

The Tree seeds and seedlings VC development after the end of the project will be highly dependent on public and projects tenders. Even if some seedlings could be sold in the local market, it would probably not be sufficient to sustain a commercial nursery. Because of this strong uncertainty, we recommend COMBIO project to support the cooperative organization and capacity building, but to avoid big investments.

5.1.1 Market analysis and forecasted business growth

Demand analysis

Rwanda has promoted an ambitious National tree planting goal with 30 million tree seedlings, including a fair percentage of native trees (around 20%), including around 18,000ha of native species through TREPA project in 2023-2024. Other projects and initiatives are contributing to this goal (AREECA, COMBIO, DESIRA, World Vision, etc.).

Although native tree species are crucial for ecological restoration due to their adaptation to local environments, National investment in native tree species is still limited because of several factors, including an industry demand and interest still quite low for native species. Exotic and adapted timber tree species (such as Eucalyptus spp., Grevillea robusta and Cupressus spp.) remain the most produced and purchased by the industry, appreciated by smallholders and companies, for their fast growth, suitability for timber, popular timber species, high value and durable wood.

The low general commercial interest in native tree seeds and seedlings can also be explained by a lack of investment in previous years, process of collective native tree seeds that needs improvement, and lack of knowledge in native seeds germination and multiplication.

Opportunities are however raising, with a strong culture of utilization of native plant and tree species for natural medicine (using local pharmacopeia), afforestation initiatives, growing agroforestry practices, and native fruit and vegetable species.

Strategy to grow the business

Analyses show that the growth should be progressive and humble in the first years, and production should be based on projects (following response and wining of tenders), to avoid over-production and losses.

It is suggested to diversify nursery's offer, with a range of native tree seedlings in response to projects and tenders and agroforestry, and a range of native and adapted fruit species, that can give faster and more ensured revenues, by being sold to nearby local smallholders.

Tree seed collection and commercialization potential

The market for native tree seeds in Rwanda is growing, driven by conservation and reforestation efforts, and rising needs from stakeholders, government initiatives and various projects for quality indigenous plant material. However, the market faces challenges such as limited availability, lack of know-how on some specific tree species, high production costs, and the need for better quality control. Most seed collection have been undertaken in other agroecological zones, such as in Rwanda's Western Province, Nyungwe Forest National Park, but under COMBIO, the RFA and ENABEL specialists have carried on Akagera NP seed collection.

Before distributing tree seeds to end users, the Tree Seed Center must ensure the quality of three seeds by sampling and testing, usually by assessing seed vigour of every seedlot through measurement of germination rate and seedling growth rate, both in the nursery and laboratory. Important to note that in 2018 (see MLF, 2018[2]) most quantities of tree seeds used in Rwanda were not produced by the formal sector, instead by individual farmers or cooperatives, although often with lack of support resulting in poor quality and low germination rates. TSC has been involving farmers' cooperatives in tree seeds supply on contract basis. From TSC experience, main issues are linked to incomplete information about the origin and provenance of seeds, choice of tree, or cooperatives purchasing from non-contracted tree seed dealers.

There is yet room for specific studies on factors limiting seed germination, and thus supporting CBS to focusing on native seeds which have shown less barriers and constraints.

In order to develop tree seed commercialization from CBS, cooperatives located in Sanctas where there is no access to the required tree species, will need to be supported in being granted access to Akagera NP or another potential forest area, by RFA and the TSC.

[2] MLF, 2018. National Tree Reproductive Materials Strategy 2018-24, 59p.

5.1.2 Breakdown of investments

Training

Training modules and modalities are described in the below roadmap. Below costs include trainer fees, accommodation and transport. Trainees are compensated around RWF 2,500/day.

Cost items	*Unit cost RWF*	*Number of item/unit*	*Funding Source*	*Comments*	*Y1 to Y5*
Training and capacity building					**4 100 000**
Exchange visit with 2 to 3 professional and successful nurseries managed by cooperatives	2 000 000	1	ENABEL	Identification and contact of 2-3 professional nurseries managed by cooperatives (link with RFA and projects). Selection of 3 cooperative members by CBS (max 18 people). Organization of a 2 days exchange visit in the selected cooperatives	2 000 000
Tree seed collection and processing training	400 000	1	ENABEL/RFA/TSC	Training on tree seed collection and processing will be organised with ENABEL specialists, as well as RFA and the Tree Seed Center, with potential visits in Akagera NP for demonstration	1 200 000
Continuous technical training	200 000	3	ENABEL	4 trainings of ½ to 1 day per year per cooperative (10 members per training). Each training includes all the basics of nursery management: general maintenance, etc.	600 000
Tender prospection and preparation	200 000	1	ENABEL	As most of the native tree seeds and seedlings demand will come from projects, CBCs will have to be trained on responding to tenders, and supported for first tenders applications, in a view to maximise chance in winning tenders.	200 000
Support knowledge sharing between CBCs	100 000	1	ENABEL		100 000

Nursery implementation and maintenance costs

Nursery implementation and maintaining costs				In most of the cases, the small-scale nureries have been already implemented with the support of COMBIO.	**8 620 000**
Poll trees for shading	1 000	250	ENABEL	3 to 5 m Eucalypus polls for pilars and structure. If 20 m x 20 m, one vertical poll every 2,5 m = 64 polls. For horizontal ones, 2 * 8 * 8 = 128 polls. Average of 250 polls every 2 years	750 000
Shed net in Black including all fixing accessoires (75% filter)	2 600	400	ENABEL	20 m x 20 m nursery = 400 m². To be replaced every 2 years	3 120 000

Road sign (2 m x 1,5 m)	650 000	1	ENABEL	2 faced color painted road sign in metal (at least 2m x 1,5 m). Refurbished and repainted every 2 years.	850 000
Small equipment (sickles, water can, wheelbarrows, tarpaulins, etc.)	300 000	1	ENABEL	Depending of the needs in each nursery. For small equipment 300 000 RWF every 3 years. Possibles : Sickles, Water can, Wheelbarrows, nails, Jerry can, tarpaulins, basins, Machetes, hoes, tridents, Woven sacks, Rake, sprayers, Bottes, Rain coats, etc.	600 000
Small storage building (only for nursery equipements, inputs and seeds)	2 000 000	1	ENABEL	2 options : the main building of the CBS is close to the nursery and has enough space to store small equipment and seeds. OR, every nursery has a small 2,5m x 2,5m building for equipment and seeds storage. Need to be maintained every 5 years	2 300 000
Water pump and equipments	500 000	1	ENABEL	Not needed in most of the nurseries. To be replaced after 4-5 years	1 000 000
Maintenance and renewal of equipment and infrastructure			CBC	Maintenance and renewal of all equipment and material	-

Functional costs

Functionnal costs					**28 750 000**
1 permanent supervisor salary per month (3 days/week)	100 000	12	ENABEL	1 or 2 members of the coop in charge of the nursery management (if 2, they can alternate responsibility over the course of the month or for longer periods). Selected for their availability, skills and knowledge in the sector. Has to be trained.	6 000 000
2 permanent workers salary per month (3 days per week each)	50 000	24	CBC	2 permanent workers in charge of preparing the seeds, seedlings bas, catering, pruning, nursery maintenance, etc.	6 000 000
Daily workers	2 000	400	CBC	Very difficult to estimate. Average of 400 man-day of work for 40 000 seedlings	4 000 000
Seed collectors workers	5 000	200	ENABEL/RFA	For five species to be collected yearly, an average of 20 man days per year for 10 CBC members	
Seeds supply (outsourced)	25 000	25	ENABEL/RFA/TSC	Very difficult to estimate. 25 kg of diverse seeds, average price : 25 000 RWF/kg (type 1 and 2 seeds at the beginning)	3 125 000
Compost per 5 tons	100 000	4	ENABEL	Average of 20 tons of compost per year for 40 000 seedlings.	2 000 000
Seedlings bags x500	2 500	90	ENABEL		1 125 000
Seed collection equipment and tools	2 000 000	1	ENABEL	Specific items for seed collection (such as ladders, gloves, bags, etc.). Refurbishment every year in the three first years.	6 000 000
Transport to the plantation site	100			Very difficult to estimate at this stage	-
Pest control material / Fungicide	10 000	10	ENABEL	Depending of the needs in case of pests or sanitary issue	500 000

Maintenance and renewal of equipment and infrastructure			CBC	Compost, seedling bags and pest/funghi control material renewal	-

5.1.3 Total investment phased over 10 years

Cost items	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Training and capacity building	**2 600 000**	**900 000**	**600 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Exchange visit with 2 to 3 professional and successful nurseries managed by cooperatives	2 000 000									
Tree seed collection and processing training	400 000	400 000	400 000							
Continuous technical training	200 000	200 000	200 000							
Tender prospection and preparation		200 000								
Support knowledge sharing between CBCs		100 000								
Nursery implementation and maintaining costs	**4 740 000**	**-**	**1 390 000**	**300 000**	**2 190 000**	**-**	**1 690 000**	**-**	**2 190 000**	**300 000**
Poll trees for shading	250 000		250 000		250 000					
Shed net in Black including all fixing accessoires (75% filter)	1 040 000		1 040 000		1 040 000					
Road sign (2 m x 1,5 m)	650 000		100 000		100 000					
Small equipment (sickles, water can, wheelbarrows, tarpaulins, etc.)	300 000			300 000						
Small storage building (only for nursery equipements, inputs and seeds)	2 000 000				300 000					
Water pump and equipments	500 000				500 000					
Maintenance and renewal of equipment and infrastructure							1 690 000		2 190 000	300 000
	-									
Functionnal costs	**7 550 000**	**7 550 000**	**7 550 000**	**5 550 000**	**5 550 000**	**5 550 000**	**5 550 000**	**5 550 000**	**5 550 000**	**5 550 000**
1 permanent supervisor salary per month (3 days/week)	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000
2 permanent workers salary per month (3 days per week each)	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000
Daily workers	800 000	800 000	800 000	800 000	800 000	800 000	800 000	800 000	800 000	800 000
Seed collectors workers	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000	1 000 000
Seeds supply (outsourced)	625 000	625 000	625 000	625 000	625 000	625 000	625 000	625 000	625 000	625 000
Compost per 5 tons	400 000	400 000	400 000	400 000	400 000					
Seedlings bags x500	225 000	225 000	225 000	225 000	225 000					
Seed collection equipment and tools	2 000 000	2 000 000	2 000 000							
Transport to the plantation site	-	-	-	-	-	-	-	-	-	-
Pest control material / Fungicide	100 000	100 000	100 000	100 000	100 000					
Maintenance and renewal of equipment and infrastructure						725 000	725 000	725 000	725 000	725 000

5.1.4 Financial analysis

Income on an annual basis and over 10 years

There is currently no established market for native tree seedlings in Rwanda, making it challenging to accurately assess the economic potential of this business. Despite the increasing interest in reforestation and environmental conservation, the commercial infrastructure for native tree seedling production and distribution remains underdeveloped. This lack of market data and precedents means that precise economic evaluations and projections are difficult to determine at this stage. Therefore, while the environmental benefits of promoting native tree seedlings are clear, further research and development are needed to fully understand and unlock the economic opportunities within this sector.

Among the 46 native species planted as a pilot project by COMBIO, there is still no clear understanding of the production costs, market demand, and therefore the specific sales prospects for each species. While the pilot initiative has provided valuable insights into the growth and adaptability of these native species, comprehensive data on the economic aspects remains insufficient. This lack of detailed information makes it challenging to develop precise strategies for scaling up production and marketing these species. Consequently, further analysis and market research are necessary to better grasp the financial viability and commercial potential of each native tree species.

Therefore, we have made conservative assumptions by considering three potential distinct selling prices at 150, 300, and 800 Rwandan francs per unit. In terms of potential production and sales volumes, we have estimated a maximum of 40,000 units per year, distributed among the different price categories. The production potential is estimated to be 40% in the first year, 50% in the second year, 70% in the third year, and 100% from the fourth year onwards.

We have also included assumptions on income from tree seeds collection and sales to the TSC, based on three types of seeds, and number of man days attributed to this activity by each CBC.

From Y1 to Y5:

Revenue items	*Unit price RWF*		*Y1 to Y5*	Y1	Y2	Y3	Y4	Y5
Native trees seedlings type 1	***150***	***20 000***	***15 000 000***	**3 000 000**	**3 000 000**	**3 000 000**	**3 000 000**	**3 000 000**
Native trees seedlings type 2	***300***	***15 000***	***22 500 000***	**4 500 000**	**4 500 000**	**4 500 000**	**4 500 000**	**4 500 000**
Native trees seedlings type 3	***800***	***5 000***	***20 000 000***	**4 000 000**	**4 000 000**	**4 000 000**	**4 000 000**	**4 000 000**
Fruit tree seedlings			**-**	**-**	**-**	**-**	**-**	**-**
Native seeds type 1	***10 000***	***15***		**150 000**	**150 000**	**150 000**	**150 000**	**150 000**
Native seeds type 2	***25 000***	***10***		**250 000**	**250 000**	**250 000**	**250 000**	**250 000**
Native seeds type 3	***60 000***	***5***		**300 000**	**300 000**	**300 000**	**300 000**	**300 000**
		Revenue (in RWF)		**12 200 000**	**11 500 000**	**11 500 000**	**11 500 000**	**11 500 000**

From Y6 to Y10:

Revenue items	*Unit price RWF*	*Number of item/unit*	Y6	Y7	Y8	Y9	Y10
Native trees seedlings type 1	*150*	*20 000*	3 000 000	3 000 000	3 000 000	3 000 000	3 000 000
Native trees seedlings type 2	*300*	*15 000*	4 500 000	4 500 000	4 500 000	4 500 000	4 500 000
Native trees seedlings type 3	*800*	*5 000*	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
Fruit tree seedlings			-	-	-	-	-
Native seeds type 1	*10 000*	*15*	150 000	150 000	150 000	150 000	150 000
Native seeds type 2	*25 000*	*10*	250 000	250 000	250 000	250 000	250 000
Native seeds type 3	*60 000*	*5*	300 000	300 000	300 000	300 000	300 000
		Revenue (in RWF)	11 500 000	11 500 000	11 500 000	11 500 000	11 500 000

Net profit on an annual basis and over 10 years

It is essential to remain very cautious in the economic projections and analyses proposed. Indeed, this business will be highly dependent on public orders and project tenders, particularly on the cooperative's ability to respond to, secure, and execute them both qualitatively and quantitatively.

Based on the assumptions, the net profit is projected to be negative by 2.7 million RWF in the first year, primarily due to investment costs in equipment and training. However, considering a progressive increase in production and sales up to a capacity of 40,000 plants per year, we can expect a net profit of 2 to 6 million Rwandan francs per year.

From Y1 to Y5::

	Y1 to Y5	Y1	Y2	Y3	Y4	Y5
Total cost (in RWF)	41 470 000	14 890 000	8 450 000	9 540 000	5 850 000	7 740 000
Total cost excluding ENABEL support (in RWF)	10 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000
Revenue (in RWF)		12 200 000	11 500 000	11 500 000	11 500 000	11 500 000
Net margin (in RWF)		-2 690 000	3 050 000	1 960 000	5 650 000	3 760 000

From Y6 to Y10:

	Y6 to Y10	Y6	Y7	Y8	Y9	Y10
Total cost (in RWF)	**14 890 000**	**5 550 000**	**7 240 000**	**5 550 000**	**7 740 000**	**5 850 000**
Total cost excluding ENABEL support (in RWF)	**17 805 000**	**2 725 000**	**4 415 000**	**2 725 000**	**4 915 000**	**3 025 000**
Revenue (in RWF)		**11 500 000**	**11 500 000**	**11 500 000**	**11 500 000**	**11 500 000**
Net margin (in RWF)		**5 950 000**	**4 260 000**	**5 950 000**	**3 760 000**	**5 650 000**

Financial results

Due to significant uncertainties regarding volume and price sales prospects, as well as the regularity and scale of markets accessible to cooperatives, detailed financial analysis for this value chain appears impractical at this time.

Sensitivity parameters

Parameters that may involve changes over induced costs, income and thus financial results can be considered as follow:

- **Sales Variability**: changes in sales volume can impact profitability, as sales may decrease due to project dynamics fluctuations, win or loss of bids (also depending on market competition), seasonality, or unexpected events.
- **Cost of Goods Sold (COGS):** fluctuations may occur in material costs, labor expenses, and production costs, through price increase.
- **Gross Margin**: changes in gross margin (revenue minus COGS) may affect overall profitability, and external factors (e.g., inflation, currency exchange rates) can impact margins.
- **Operating Expenses**: cost change from fixed and variable expenses (e.g., rent, utilities, salaries) may influence net income.
- **Pricing Strategy**: CBCs may want to test different pricing scenarios, as a price increase or decrease may affect demand and revenue.
- **Environmental and Regulatory Risks**: climate-related risks (e.g., weather affecting seed germination, pest attacks) can have an important impact on production and has to be monitored. Compliance with local regulations and permits also needs to be addressed.
- **Operational Risks:** due to the new implication of CBCs in native tree seedlings, specific risks (e.g., pest outbreaks, nursery management, etc.) may have a big impact if CBC members have not been well prepared to risk management, or if nurseries are being neglected.

Recommendations for CBCs reaching TSC certification

- Ensure technical capacity strengthening on the long term and ensure knowledge transfer
- Subsidize equipment and resources, and promote low-interest loans in the long term for the purchase of equipment
- Provide regulatory barriers understanding and compliance support
- Support guaranteed market access, through own nursery or TSC
- Establish a clear standardized quality assurance system and control framework where CBCs adhere to NTSC standards for seed collection, processing and packaging
- Fix pricing agreements in a fair and transparent framework benefiting both cooperatives and the NTSC. Based on seed type, quality and market demand

5.2 Tree seeds and seedlings implementation roadmap

5.2.1 General tree seeds and seedlings roadmap

Title of the project	**Tree seeds and seedlings development**			
Other participants	RFA, Tree seeds centres, TREPA, others projects			
Objective of the project	Developing a commercial tree seeds and seedlings nursery managed by the cooperative			
Expected results from the project	R1. The cooperative has the knowledge and skills to manage a commercial tree seedlings nursery R2. The cooperative is well organized to manage the activity in terms of administrative, technical and financial requirements. R3. The nursery is equipped and operational for an average production of 30 000 to 40 000 per year, with COMBIO needing at least 30,000 seedlings per year in 2024 and in 2025. R4. The cooperative has the capacity to monitor national tenders and to bid for seedlings production R5. The cooperative sells around 30kg of seeds yearly to the TSC			
Steps and actions to be taken to implement the project	**Timeframe**	**Funding source**	**Organizational and technical modalities**	**Implementer**
1/ Structuration and training of CBC members				
Exchange visit with 2 to 3 professional and successful nurseries managed by cooperatives	September 2024 to December 2024.	ENABEL (COMBIO project) in close collaboration with RFA	Identification and contact of 2-3 professional nurseries managed by cooperatives (link with RFA and projects). Selection of 3 cooperative members by CBS (max 18 people). Organization of a 2 days exchange visit in the selected cooperatives	ENABEL
Governance & organizational support	January 2025 to March 2025	ENABEL/COMBIO	Governance and organizational support will be provided at the initial stage of project implementation, with the support of ARCOS. This should include determining roles and responsibilities within the cooperative, supporting the decision-making process, and putting in place means of conflict resolution and consensus building. Advice is to strengthen since the beginning, understanding of potential bottlenecks and conflictual relationships within CBCs, in a view to anticipate and put in place necessary internal mechanisms, to avoid project's failure over internal governance. Outside of pure representativity, women's leadership should also be supported through dedicated sessions. Other topics should include supporting empowerment of other members of the CBC (outside of committees), in decision making, basis of economic and financial management, and participatory management methods.	ARCOS

			It is important to define, with each cooperative, the organizational arrangements for the nursery management. Two possible models have been pre-identified: i) 1 nursery manager and 1 to 2 permanent staff + daily workers ; ii) rotations between members from week to week between different activities.	
Continuous technical training	January 2025 to December 2025	ENABEL (internal or external nursery technician)	Learning by doing approach. 4 trainings of ½ to 1 day per year per cooperative (10 members per training). Each training includes all the basics of nursery management: general maintenance, preparation of soil mixture to be used, arranging pots into seedbed, seedbed preparation, seed pre-treatment, sowing and grafting, pruning (which species etc.), weeding, watering, pest and disease control, etc.	ENABEL, RFA
Tree seed collection and processing training	January 2025 to December 2025 / ENABEL / RFA / TSC			
Tender prospection and preparation	January 2025 to December 2026	ENABEL	As most of the native tree seeds and seedlings demand will come from projects, CBCs will have to be trained on responding to tenders, and supported for first tenders applications, in a view to maximise chance in winning tenders. Few members only (nursery president, committee member) can be trained, to support responding to tenders, but will require support at the beginning. There are three categories of tenders for nursery : (i) production only ; (ii) production & transport ; (iii) production, transport & replanting. The first type reduces logistical complexity, but second and third options bring more potential for tender response and income. It is also important to evaluate risks for the third type of bid (production, transport & planting): sometimes bad weather (in the dry period) leads to big mortality of trees, and reduced income, as payment occurs over success of plant survival.	ENABEL CBC
Support knowledge sharing between CBCs	January 2025 to December 2026 and then continuously	CBC	As most CBCs will face common issues, and will continuously grow knowledge about seed collection, preparation and production techniques and practices, it is advised that a sharing group is put in place since the beginning through WhatsApp or Facebook dedicated groups, and proactively sharing tips or challenges.	N/A
2/ Nursery instalment (reinforcement or construction)				
Land purchase or attribution (optional)	January 2025 to March 2025	ENABEL District/ sector	In the case when the nursery cannot remain on the CBS site and needs to be moved near a water point, it should be required to district and sector to support finding new area for nursery with access to water. Land wavering could be needed if the area is not flat or rocky.	
Reinforcement / construction of nursery	January 2025 to March 2025	ENABEL	Depending on the state of the current nursery (initiated with ENABEL support), the structure may need to be moved or reinforced, using either temporary structure (with	CBC

			local material) or semi-modern nursery with metallic feet / roof (however less advised because of uncertain nature of economic outcomes). Shade nets can also cover part of the nursery, especially for fragile species. In some CBSs, such as Nyagatare Karushuga, termites are threatening wooden structure (can last for maximum 2 seasons) and suggest to go for metallic structure, but due to the improbability of nursery's production success in this area in the long term, it is advised to lower initial investment.	
Water pump installation (optional)	January 2025 to March 2025	ENABEL	For nurseries that do not have water access, a borehole can be dug for dry season's seedlings watering.	ENABEL
Procurement of packaging materials and labels	January 2025 to March 2025	ENABEL	See standard list (Appendix 2).	ENABEL
Buying tools, inputs and equipment	January 2025 to March 2025	ENABEL CBC	Tools and equipment such as polybags, compost, small furniture, etc. will be required, and will need yearly replacement, starting with ENABEL on Y1 and Y2 until the end of the project, and then costs will be supported by the CBC.	ENABEL CBC
3/ Tree seeds collection and preparation				
Demand analysis for tree seeds and seedlings	Early start of the season (regular)	ENABEL CBC	The CBC should produce seedlings upon demand and guaranteed customers. High economic value species such as fruit trees or aromatic plants can be sold at the market or to schools and hospitals (World Vision project). Grafted fruit have guaranteed market (Sept-Oct), and CBCs can be linked to buyers through the district.	N/A
Tree seed collection from RFA or in local area	Every year prior to the season (regular)	ENABEL CBC	As per RFA regulations, first requirements prior to the season's start can be done to RFA (through the sector) for seed orders. If seeds are not available through tree seed centres, CBCs can have the authorization to proceed with collection themselves.	ENABEL RFA CBC
Seed maturity quality handling	From Y1	ENABEL	This process is complex to follow up as very variable for native seeds, with limited knowledge and bacKground research. For example, some seeds from 2023 season have not yet germinated. It will be key to start with less risky species to lower economic risk for the CBC, and in parallel continue to strengthen research and experimentation about various species and technical processes, with ENABEL's support.	ENABEL CBC
4/ Seedling production				
Nursery preparation / seed stand rehabilitation	From Y1	ENABEL CBC	Regular maintenance of the nursery's site is needed, even off-season, to lower quantity of work needed for preparation / rehabilitation before a season's start.	ENABEL CBC

Seedling transplantation	From Y1		ENABEL CBC	Time needed for transplantation is considered to be around 1 month for 40,000 seedlings for 6 people.	ENABEL CBC
Seed monitoring (watering, weeding, protect against pests, pruning, etc.)	From Y1		ENABEL CBC	Pot filling (with compost & seed) 6 people = 1 month Depending on pot size, around 500-600 a day. Small pots around 300/days Then seed collection & sowing, then watering twice / day watering : morning & evening 1 people Pruning: 100 pots = 2 people (depends on species)	CBC
Seed quality assurance and control	From Y1		ENABEL RFA	Seed quality assurance involves rigorous processes to ensure that CBCs receive high-quality seeds for optimal productivity. RFA plays a crucial role in maintaining these standards and facilitating seed quality.	ENABEL CBC
5/ Marketing and sales					
Marketing strategy definition	From Y1		ENABEL	In the initial stages of the nursery's business, part of the sales will be ensured by COMBIO project (30,000 native seedlings/year), and then production will depend on earned bids (TREPA, One Acre Fund, agroforestry needs, World Vision, etc.). Fruit seedlings can be sold locally in priority, and in case of low demand, can be taken to the closest city market.	N/A
Transplantation to adequate packaging	From Y1		ENABEL CBC	Important to note that, if the CBC would handle transportation (by winning bid or in a view to access bigger city market), costs transportation not at full capacity have to be calculated, as well as potential losses that may occur at the end of the day (if the seedling is not sold at market during the day, it won't survive the trip back).	CBC
Transportation to market areas	From Y2		CBC	It is advised to rather sell on nursery site, and can transport only if orders are placed, or to market through intermediaries.	CBC
Transportation of seeds to TSC	From Y1	CBC			

5.2.2 Specific modalities for Tree seeds and seedlings BP implementation by CBS

5.2.2.1 Ngoma Zaza

Selected area for Nursery's instalment

The Zaza CBS site is ideal for tree seed and seedling production, with direct access to water and plenty of land for establishing nursery beds. The gentle slope is not a constraint for setting up the nursery.

However, limited accessibility and the distance to main roads pose potential challenges for the development of the activity, particularly when fulfilling large tenders that require the mobilization of large vehicles for transporting seedlings.

Specific considerations and operational recommendations:

1. Adress on-site transportation solutions such as adapted motorcycles or smaller transport units that can navigate the existing terrain and then transfer seedlings to larger vehicles at more accessible points.
2. Establish partnerships with local transport companies or cooperatives to ensure reliable transportation services when needed.
3. Advocate for Infrastructure Development with local authorities to advocate for infrastructure improvements that enhance accessibility to the site.

5.2.2.2 Kirehe Nyankurazo

Selected area for Nursery's instalment

The Nyankurazo CBS faces challenges in establishing a nursery on-site due to the lack of direct access to water and suitable flat, fertile land. Currently, the CBC utilizes public lands near the Akagera River, acquired through expropriation for the Rusumo hydroelectric project, to produce necessary seedlings for afforestation. Therefore, a critical priority in the initial stages of the project will be to secure permanent access to fertile land near water sources, potentially through a long-term lease agreement.

Conversely, the CBS benefits significantly from its proximity to National Road 4, which facilitates easy transportation of seedlings. This advantage ensures swift access to distant markets and enhances the CBS's capability to fulfill public tenders efficiently.

Specific considerations and operational recommendations:

1. Prioritize negotiating a long-term lease or land-use agreement for fertile land near water sources to establish a nursery.
2. Establish partnerships with local transport companies or cooperatives to ensure reliable transportation services when needed

5.2.2.3 Gahini Kayonza

Selected area for Nursery's instalment

The Gahini nursery site is ideally located, situated along a main road with easy access to water. Additionally, it is close to the town of Kayonza and on the route to and from Akagera National Park.

Specific considerations and operational recommendations:

There is already a private nursery nearby, whose manager is a member of the cooperative. It is imperative to address this situation by ensuring minimal potential competition with the existing business and, if possible, leveraging the cooperative's technical expertise and knowledge of the seedlings market.

5.2.2.4 Gatsibo Ryarubamba (Rubona)

Selected area for Nursery's instalment

As the temporary nursery was installed in an existing nursery (from which the president is a member of the CBC), the project intends to pursue activities within the same location. If roles and management are not well split, there could be a conflict with existing nursery after the project leaves. It is suggested to start a dedicated place, near the existing nursery site.

Specific considerations and operational recommendations:

The CBC is almost composed of 70 members, it can specialize in BK and nursery and can rotate according to activities that can be done. Very few members have experience on BK or TSS, so the experienced members can be further trained to drive others in parallel.

The ideal time to start TSS: May for native species, June-July for other species.

From June to August, harvesting from agricultural crops can mobilize people around 3 days a week.

5.2.2.5 Nyagatare Karushuga

Selected area for Nursery's instalment

The CBS location disposes of access to water and is connected by the road, but its remoteness from the city, village, and few challenges (pests, baboon damage and threats) raise questions about the viability of the activity.

Specific considerations and operational recommendations:

The CBC have started opening an account (tontine) and seem well organized to conduct the activity. Few members within the CBC have applied and won tender, which is a positive signal for future tenders.

As per Progress report #1, specific elements are however threatening the long-term viability of the nursery in this CBS, such as baboons (mainly), hippos, termites, and future projects (extension and opening of Tanzania border, etc.). It is thus advised to lower investment and mitigate expectations.

6 Concluding remarks and next steps

The second phase of the study was conclusive, as all planned activities were undertaken successfully with the support and coordination of ENABEL's officers, and with the presence of CBS members throughout all stages of the consultative process.

Although workshops with CBCs were found to be successful and collaboratively design the project's rationale and logical order, unexperienced CBCs or members were logically rather in the discovery of specific steps needed to put in place the business.

The beekeeping section appears to be the most detailed, as it is more classic and better documented. The ecotourism section, concerning only to CBCs, was the one for which the team struggled most to gather specific information/data and propose relevant models, as it is still quite exploratory, and can only emerge with partners (private / NGO or public) or initiatives, that have not been identified yet. The TSS section can be positioned somewhere between the two other VCs, with a fair amount of information, but a risky market approach as the VC has to be developed without any knowledge of prices and market prospects (tenders).

For implementation ease and due to the similar structure of CBS cooperatives (new and with low competencies), roadmaps were harmonized with one main roadmap by value chain, as similar steps have to be respected for the activity set up, start and continuity. Specificities by CBS were detailed for each VC for those concerned. Each VC presents a dedicated business plan (with different levels of deepening, according to the level of information and readiness), to be used as a live tool with the cooperatives and customized if needed, from the initial stages of implementation, throughout the entire process and hand overed as a guiding tool after the project's exit.

The presentation of current **Progress report #2** was conducted during the Province Workshop #2 in August 2024. The main comments have been treated in this version of the report.

The next and final step is to compile the main findings and recommendations of the study in a Synthesis report.

Appendix

Appendix 1. List and specs of BK equipment

Starting Beekeepers

Here's the comprehensive list of beekeeping equipment with detailed specifications and prices tailored to the provided budget for a starting beekeeper kit. Prices are estimates based on quotations as of May 2024. All costs have been majored by 20% in the BP tables to provide for adjustments.

1. Acquisition of Langstroth Beehives - Initial

- One-Floor Langstroth Wood Modern Beehive Box (10 frames)
    - Made from well-dried timber, includes 10 frames.
    - Box size: 50 cm (length), 42 cm (width), 25 cm (height).
    - Price: 48,000 RWF.
- Extension for Langstroth Beehive
    - Additional box for expanding hive capacity.
    - Price: 20,000 RWF.

Total for Langstroth Beehive: 68,000 RWF.

2. Acquisition of Bee Colonies - Initial

- Bee Colonies: Estimated Price: 12,000 RWF.

3. Acquisition of Smokers, Suits, and Other Tools - Initial

- Beekeeping Suit (Cotton)
    - Material: Cotton, with veil and zipper. Available in sizes L, XL, XXL.
    - Price: 45,000 RWF.
- Beekeeping Smoker
    - Stainless Steel, with a height of 19.3 cm and diameter of 10 cm.
    - Price: 25,000 RWF.
- Beekeeping Gloves
    - Sheepskin gloves, size XL, color yellow.
    - Price: 11,000 RWF.
- Bee Brush: Price: 6,000 RWF.
- Hive Tool: Price: 6,000 RWF.
- Bee Boots: White boots, sizes 7, 8, 9. Price: 15,000 RWF.
- Plastic Queen Excluder: Price: 7,000 RWF.
- Bee Feeder (Plastic, 500 ml): Price: 7,500 RWF.
- Uncapping Fork: Price: 7,000 RWF.
- Wire Embedder: Price: 6,000 RWF.
- Queen Marker with Cage: Price: 10,000 RWF.
- Pollen Trap: Price: 30,000 RWF.

Total for Smokers, Suits, and Tools: 175,500 RWF.

4. Honey Processing Equipment Acquisition

- 4-Frame Manual Honey Extractor
    - Manual-powered with a stainless steel inner basket.
    - Price: 410,000 RWF.
- Honey Tank (500 Litres, Stainless Steel): Price: 1,950,000 RWF.
- Uncapping Tray: Price: 250,000 RWF.
- Honey Press Machine
    - Stainless steel press, diameter: 30 cm (outer), 23 cm (inner).
    - Price: 260,000 RWF.
- Manual Beeswax Processing Machine: Price: 280,000 RWF.

Total for Honey Processing Equipment: 3,150,000 RWF.

5. Consumables Acquisition (Beeswax Sheets, etc.)

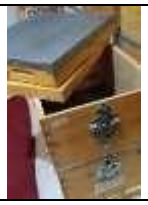
- Beeswax Sheets (2 kg): Price: 26,000 RWF.
- Propolis Collector: Price: 10,000 RWF.
- Wire Embedder: Price: 6,000 RWF.

Summary

1. Langstroth Beehive and Extensions: 68,000 RWF.
2. Bee Colonies: 12,000 RWF.
3. Smokers, Suits, and Other Tools: 175,500 RWF.
4. Honey Processing Equipment: 3,150,000 RWF.
5. Consumables (Beeswax Sheets, etc.): 42,000 RWF.

Grand Total: 3,447,500 RWF.

The following illustrations are provided for futher reference.

NO	Product descriptions	Photo	Price (RWF)	NO	Product descriptions	Photo	Price (RWF)
01.	Langstroth two floor Modern Beehive box (20 frames)		68,000	02.	One floor Langstroth wood Modern Beehive box (10 frames)		48,000
03.	Rwandan Beehives		55,000	04.	ADVANCED BEE HIVES (ALHOSUERY)		125,000

05.	Traditional Wood Beehive box (20 frames)		57,000	06.	KTB Kenya top bar beehive		55,000
07.	Beekeeping Suite Made in Egypt , or Rwanda		40,000	08.	Beekeeping Suite Made in Turkey	 	65,000
09.	Face veil		7,000	10.	Half Beekeeping Suite		25,000
11.	Gloves Egypt	 	6,000	12.	Gloves Pakistan		15,000
13.	White plastic boots		10,000	14.	Bee Venom collecting device DR AHMED		86,500
15.	Queen Excluder (Metal)		18,000	16.	Queen Excluder (Plastic)		6,000

17.	**Propolis trap**		8,000	18.	Frame Holder		15,000
19.	Queen Excluder (VERTCAL)		**ONE FRAME 8.000** **TWO FRAMES 9,000** **THREE FRAMES 10,000**	20.	Pollen trap drawer		25,000
21.	**Collecting Honey comb wooden frame**	 	4,000	22.	Royal Jelly Collector		15,000
23.	Bee wax foundation 2KG		17,500 1000 per piece	24.	Natural and Pure Honey "**RUCHER**"		8,000 Per kilo
25.	Uncapping Table (1 meter) Stainless Steel Big 304		180,000	26.	Bee Vitamins & Food (Bee Fonda) 1Kg		4,000 per piece
27.	Manual Beeswax processing machine cylinder		955,000	28.	Manual Beeswax processing machine		750,000
29.	Bee WAX stainless Compressing machine مكMس شمع استانلس الدولiة		280,000	30.	Plastic Feeder (cup)		6,000
31.	Feeders غذاات صغ هi medium		5,000	23.	Feeders غذاات كب هi JUMBO		6,000

NO	Product descriptions	Photo	Price (RWF)	NO	Product descriptions	Photo	Price (RWF)
35.	Uncapping fork Stainless Steel		8,000	36.	Metal Smoker INOX Smoker	 	18,500 20,000
37.	Plastic Queen cage Cylinder		800	38.	Plastic Queen cage		800
39.	Galvanize Wire Spool		6,000	40.	Hive Tool Beehive Opener Iron		6,000
41.	Metal circled Queen cage		500	42.	Bee Brush		6,000
43.	Karl JENTER Device for Queen Raring		175,000	44.	Refractometer		110,000
45.	Metal Queen Catche r		6,500	46.	Plastic Queen Catcher		3,500
47.	Marking pen (Queen bee marking pen set blue, red, yellow, white, green,) POSCA…		5,500 per pen	48.	Honey splash Made in wood		500

49.	HONEY **SIEVES**		35,000	50.	Honey Sieve Plastic (Conical)		10,000
51.	**Air Blowerf or bees evacuating from traditional hives**		350,000	52.	Collecting Bee VENOM Devices (HOSAM) جهاز سم النحل		125,500
53.	Wood Swap Traps		6,000	54.	Marking Bee Queen Cage		15,000
55.	Honey Tank stainless (Maturateor) **30 litter**		175,000		**Baskets/indobo with tap**		50,000
57.	Honey Tank stainless (Maturateor) **100 litter**		240,000	56.	(Honey Tank 304 stainless (Maturateor) **200 litter**		275,000
59.	Honey Tank stainless (Maturateor) **500 litter**		1,550,000	58.	(Honey Tank stainless (Maturateor) **1000 litter**		1,950,000
61.	Manual Extractors **frames)** **2 فرز (2 برواز**		265,000	60.	**Baskets/indobo with tap**		50,000

Appendix 2. List of TSS equipment

No	Inputs	Quantity	Unit Price	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
1	Sickles	2	5,605.00	11,210.00			11,210.00	
2	Sheetings	6	12,000	72,000		72,000		72,000
3	Water can	10	3,500	35,000			35,000	
4	Tree for nursey construction (Number)	800	500	400,000	-	400,000		400,000
5	Shade net (m)	800	3,000	2,400,000		2,400,000		2,400,000
6	Wheelbarrows	6	40,000	240,000				
7	Nails (Kg)	30	1,500	45,000		45,000		45,000
8	Pesticides	FF	100,000	100,000	100,000	100,000	100,000	100,000
9	Jerry can	6	1,000	6,000	6,000		6,000	-
10	Tarpaulins	5	180,664	903,320				903,320
11	Basins	10	1,500	15,000	15,000		15,000	-
12	Machetes	10	2,000	20,000	20,000	20,000	20,000	
13	Hoes	10	2,500	25,000	-	25,000		25,000
14	Tridents	8	2,500	20,000		20,000	-	20,000
15	Woven sacks	100	584	58,410	58,410	58,410	58,410	58,410
16	Small bags for seedlings (Kgs)	550	3,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000
17	All-purpose strong multifunctional cotton rope durable long strap (B-2 color)	2	4,661	9,322		9,322	-	9,322
18	Drying	5	100,000	500,000			500,000	-
19	Rake with its wooden handle	3	5,605	16,815		16,815	-	16,815
20	Sprayers for peciticides	3	25,000	75,000		-		75,000
21	Bottes	4	8,000	32,000		32,000	-	32,000
22	Aluminium Extended forestry Ladder	1	565,810	565,810				
23	Rain coats	10	10,000	100,000	-	100,000		100,000
24	Fertilizer (Organic manure (KG)	30,000	10	300,000	300,000	300,000	300,000	300,000
25	Land lease	2	100,000	200,000	200,000	200,000	200,000	200,000
26	Material transportation	FF	657,336	657,336				

Appendix 3. Field Mission #2 schedule

Sanca VC Study - Field mission #2 (29th April to 05th May)

DATE	TIME	Team 1 Sophia Lyamouri + Willy Mwiza Enabel : Gaspard	Team 2 David Combaz + Eric Kazubwenge Enabel : François	Team 3 Anis Chakib + Ange Imanishimwe Enabel : Elias
		TL Ecotourism + KE Beekeeping (+ tree seedlings)	**TL Beekeeping + KE Tree seedlings (+ ecotourism)**	**TL Tree seedlings + KE Ecotourism (+beekeeping)**
29/04/2024 Monday		Travel from France for TL and from Butare to Kigali for KE		
30/04/2024 Tuesday	AM	**Province Workshop preparation meeting with ENABEL and other VC teams**		
	PM	**VC stakeholders meetings: Eco-Tours, Akagera NP community initiative, commercial Nursery, honey commercial purchaser, etc.**		
01/05/2024 Wednesday	AM	**Internal Province workshop preparation**	**Internal Province workshop preparation**	**Internal Province workshop preparation**
	PM	2h : Kigali-Rwamagana	2h : Kigali-Rwamagana	2h : Kigali-Rwamagana
02/05/2024 Thursday	AM-PM	Province Workshop #1 on nature based value chains development in Community Biodiversity Sancta developed under COMBIO project	Province Workshop #1 on nature based value chains development in Community Biodiversity Sancta developed under COMBIO project	Province Workshop #1 on nature based value chains development in Community Biodiversity Sancta developed under COMBIO project
	5PM	2h : Rwamagana - Nyagatare	2h : Rwamagana - Kirehe	30min : Rwamagana - Kayonza
03/05/2024 Friday	AM-PM	**Nyagatare Karushuga: Roadmap Workshop (CBS representatives, local authorities, tree nusery & beekeping coop rep., etc.) max 20-25 at cell level**	**Kirehe Nyankurazo: Roadmap Workshop (CBS representatives, local authorities, coop rep, etc.) max 20-25 at cell level**	**Kayonza Jambo Beach: Roadmap Workshop (CBS representatives, local authorities, etc.) max 20-25 at sector level**
	3PM	3h : Nyagatare Karushuga - Gatsibo Ryarubamba	1h : Kirehe - Ngoma Zaza	30min : Kayonza - Rwamagana
04/05/2024 Saturday	AM	**Gatsibo Rubona : Roadmap Workshop (CBS representatives, local authorities, tree nusery & beekeping coop rep., etc.) max 20-25 at cell level**	**Ngoma Zaza: Roadmap Workshop (CBS representatives, local authorities, etc.) max 20-25 at cell level**	**Rwamagana Murambi: Roadmap Workshop (CBS representatives, local authorities, tree nusery & beekeping coop rep., etc.) max 20-25 at cell level**
	3PM	Back to Kigali	Back to Kigali	Back to Kigali
05/05/2024 Sunday	AM	Internal debriefing and working sessions	Internal debriefing and working sessions	Internal debriefing and working sessions
	7PM	International flight back	International flight back	International flight back

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