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MERCY CORPS

Assessment of the "Hill Approach": a Resilient Agriculture Food Security Project in DRC

AUGUST 2022

About SCALE

The SCALE (Strengthening Capacity in Agriculture, Livelihoods, and Environment) Award is funded by USAID's Bureau for Humanitarian Assistance (BHA) and implemented by Mercy Corps in collaboration with Save the Children. SCALE aims to enhance the impact, sustainability and scalability of BHA-funded agriculture, natural resource management, and off-farm livelihood activities in emergency and non-emergency contexts.

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Disclaimer

As an impact evaluation was not performed, this study is not able to make direct and attributable statements regarding MC's contribution to relevant outcomes.

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ACRONYMS

APC	Action pour la Paix et la Concorde
AVA	Agriculture Village Agent
BHA	USAID's Bureau for Humanitarian Assistance
BXW	Banana Bacterial Wilt
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CMD	Cassava Mosaic Disease
COCOVE	Comité de Colline Verte (Green Hill Committee)
COP	Chief of Party
CSO	Civil Society Organization
DCOP	Deputy Chief of Party
DRC	Democratic Republic of Congo
FFS	Farmer Field School
FGD	Focus Group Discussion
FSP	South Kivu Food Security Project
HA	Hill Approach
INERA	National Institute for Agronomic Studies and Research
IPM	Integrated Pest Management
KII	Key Informant Interview
LDC	Local Development Committee
LDP	Local Development Plan
M&E	Monitoring and Evaluation
MC	Mercy Corps
MoU	Memorandum of Understanding
NGO	Non-Governmental Organization
P1	Purpose 1 of FSP
P2	Purpose 2 of FSP
P3	Purpose 3 of FSP
PO	Producer Organization
PSP	Private Service Provider
QIVC	Quality Improvement Verification Checklist
RD	Resilience Design
RIO	Reseau Inter Organisationnel
SBCC	Social and Behavior Change Communication
SCALE	Strengthening Capacity in Agriculture, Livelihoods and Environment
SWC	Soil and Water Conservation
TOPS	Technical and Operational Performance Support
UEA	Université Evangélique de l'Afrique
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
WSM	Watershed Management
WV	World Vision

PREFACE

In 2016, Mercy Corps and its partners received funding from the United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA) to implement the South Kivu Food Security Project (known as FSP-Enyanya), with the goal of improving the food and nutrition security and economic well-being of 35,000 households in South Kivu, DRC.

Achieving this goal led the FSP-Enyanya team to focus on a persistent and widespread challenge in the hilly South Kivu province. Severe erosion was leading to a massive loss of soil fertility, driving a gradual decline in agricultural activities and exacerbating the land tenure insecurity faced by the sharecroppers who work these lands season after season. In response, FSP-Enyanya developed the Hill Approach pilot, the findings from which are shared in this assessment.

The Hill Approach pilot tested a model for a sustainable response to the complex challenges facing South Kivu's sharecroppers. Through the approach, FSP-Enyana brought together the landowners, the sharecroppers, and the local authorities around a commitment and a common vision for the long-term development of each hill. The team mobilized smallholder tenant farmers to achieve this vision through simple soil and water conservation schemes, promoting resilient farming practices, and strengthening the negotiation skills of tenant farmers to better assert their interests and contributions to the landowners.

The Hill Approach has been a multi-partner effort. My thanks go to the project teams, notably the Evangelical University in Africa (UEA), which initiated the approach within the consortium and conducted regular monitoring of progress, Action for Peace and Concord (APC), World Vision, and Mercy Corps for their commitment over the past six years to making this approach a rewarding and promising initiative in the fight against soil erosion in the context of South Kivu.

I would also like to thank the Ministry of Agriculture, Fisheries, and Livestock for their support in implementing the approach and for their interest in continuing the research to replicate the Hill Approach on a larger scale.

Finally, I would like to express my deep gratitude to the USAID/BHA-funded SCALE program, which, through its consultant Barbara Adolph, provided great support to the field teams during the evaluation, and to USAID/BHA for the trust it has placed in the FSP-Enyanya team over the past six years.

Jean Daniel

Jean Daniel
Chief of Party

EXECUTIVE SUMMARY

This report summarizes learning from the pilot of a "Hill Approach" in South Kivu, Democratic Republic of Congo. The Food Security Project (FSP) developed the approach in 2017/2018 to address the interrelated challenges of land degradation, low crop productivity, and insecure land tenure on hills owned by absentee landowners and farmed by tenants. It combines the collective implementation of soil and water conservation (SWC) measures, promotion of improved sustainable farming practices, and empowerment of tenant farmers to negotiate more favorable tenure conditions.

South Kivu is characterized by high levels of food insecurity and poverty, with low agricultural productivity and few off-farm income opportunities. A large proportion of farmers cultivate land belonging to large landowners, and without secure tenure, discouraging investment in the land. By working jointly with landowners, tenant farmers, and local authorities, FSP supported the rehabilitation and improvement of farmland on 18 hills on a pilot basis between 2017 and 2022. An evaluation and lesson-learning study were commissioned by FSP in early 2022 to assess the relevance, effectiveness, impact, and sustainability of the approach, and to develop recommendations for its improvement and replication.

The six-week study involved a review of project documents, meetings and key informant interviews with project staff, field visits to nine of the 18 hills to carry out focus group discussions with tenants, landowners, and FSP-initiated Green Hill Committee (COCOVE) members, and a workshop with local stakeholders. Limitations of the study are mainly related to the brevity of the field visits and document review.

The Hill Approach is designed to respond to the priority needs of tenant farmers: To reduce soil erosion, increase productivity, and increase tenure security. To address the specific socio-economic context in South Kivu, using a hill (or parts of a hill) belonging to one landowner as the target area (rather than a topographically defined catchment area) is appropriate, as the relationship between landowners and tenants is a key determinant of the sustainability of any SWC and sustainable farming measures.

The implementation of the approach involved a series of steps, designed to engage the appropriate actors and build their understanding and capacities over time:

1. Meeting between FSP, the chiefdom, group leaders, and village chiefs
2. Mapping and pre-identification of hills by health area
3. Feasibility study and final identification of hills
4. Hill design for each of the selected hills
5. Meeting between FSP and the landowners of the selected hills to present the approach
6. Presentation to the tenant farmers on each of the hills
7. Establishment of Farmer Field Schools (FFS)

8. Establishment of the COCOVE through election by FFS members
9. Distribution of seeds, tools, and seedlings
10. Launch of the SWC work on the hill with voluntary labor from all tenants
11. On-the-job training throughout the agricultural season in the FFS
12. Awareness raising and mediation activities on land conflict
13. Coaching and follow-up of activities

Tenants and landowners were involved throughout the process, but the technical aspects of the hill treatment plans, and agricultural demonstrations were developed by project experts with limited inputs from farmers.

The Hill Approach resulted in a wide range of environmental, economic, and social benefits to tenants and landowners, as well as to the community overall. These include:

Environmental

- Reduced soil erosion and increased soil quality on the hill (due to the adoption of SWC measures and an increase in organic matter application)
- Increased vegetation cover and biodiversity on the hill, improved micro-climate (due to the planting of trees, hedges, and grasses, as well as natural regeneration)
- Reduced number of bush fires (due to awareness raising via the FFS and sanctions from the COCOVE and local authorities)

Economic

- Increased yields, due to…
  - Improved farming practices, including use of organic manures (because of tenant farmer training and mobilization)
  - Increased incomes from crop sales for tenants (due to increased production and training on post-harvest handling and marketing)
  - Access to emergency cash from "caisse sociale" managed by the COCOVE
- Increased demand for land on the FSP hills, contributing to…
  - Increased area under crop cultivation
- Increased number of tenants due to increased quality and availability of farmland on the hill, resulting in…
  - Increased income from tenure fees for the landowner
  - Increased availability of labor for *salongo* for landowner
- Increased value of land on the hill
- Increased availability of timber and fodder on the hill, resulting in an increased income to the landowner
- (In some cases) Increased tenure fees for plots (benefit to landowner, but not to tenants)
- (In some cases) Reduced tenure fees for plots
- Reduced crop theft and reduced livestock damage due to increased social mobilization and collective action
- Crop diversification, contributing to…
  - Improved diets of tenants and their families and increased quantity and range of produce available in local market

Human, social and institutional

- Increased knowledge and understanding (by tenant farmers) of SWC practices, the establishment and use of agroforestry trees and fodder grasses, good farming practices, farming as a business, crop processing, and marketing (due to training and exchange visits).

- Increased ability to negotiate, mediate and address conflicts, and increased awareness of the role of women in agriculture and women leadership (due to training of COCOVE members)
- Increased social capital between farmers and between farmers and landowners and changes in attitudes, confidence, and other intangible attributes (due to the FFS process)
- (In some cases) Increased tenure security due to written tenure contracts

Landowners experienced the most significant gains overall, at virtually no cost to them. However, their agreement and cooperation were required to implement the activities, which benefited a large number (about 120-150 per hill) of tenant farmers and their families. The wider local communities also benefited from enhanced knowledge and understanding of SWC and sustainable farming practices, the availability of biomass (in particular livestock fodder) on the hill, and a reduction in water damage from uncontrolled runoff. Tenant farmers on the hill expect that benefits from the interventions will further increase, as SWC structures stabilize and trees (agroforestry and fruiting species) mature. Farmers interviewed overwhelmingly considered their investments (in the form of labor) to have been worthwhile, considering the benefits gained.

Selection criteria for the pilot hills included (a) high susceptibility to erosion, (b) the presence of currently uncultivated plots that could be rehabilitated, and (c) a single owner, who either lives in the area or where the manager has decision-making power. Landowners had to agree to collaborate with the project and accept the formation of the "Green Hill Committee" (COCOVE), representing tenants.

The sustainability and replicability of the Hill Approach will require further strengthening of the COCOVE and of the tenure contracts. FSP succeeded in introducing written tenure agreements that provide some level of certainty to tenants, but these are currently mostly annual agreements with few safeguards for tenants. In particular, landowners have in some cases increased tenure fees to reflect the increased productivity of the land on their hills, at the expense of tenants. The future maintenance of the SWC measures implemented and the application of improved farming practices – both of which require labor – will depend at least to some extent on farmers' perception of tenure security to make these investments worthwhile.

Suggestions for improvement of the Hill Approach include:

- A more systematic tracking of key outcome parameters, to ensure that the intervention generates the expected benefits and identifies any challenges early on.
- Adapting the FFS approach to emphasize farmer-led experimentation and adaptation, rather than a conventional transfer-of-technology methodology that offers limited scope for farmers' innovations.
- Aiming for a fairer distribution of benefits and costs/investments between landowners and tenant farmers, with landowners making a larger contribution to the costs of the Hill Approach.
- Linking tenure farmers on the hills to markets for surplus produce to increase their revenue and thus enhance their motivation to maintain the SWC measures on the hill.
- Replicating the approach at scale, starting with areas adjacent to the original pilot hills, and involving tenant farmers and COCOVE members from the pilot hills as trainers/facilitators.
- Developing an exit strategy for community-based organizations (FFS, COCOVE) to ensure the sustainability of the approach.

A replication of the approach will depend on the ability of development agencies (both governmental and non-governmental) to convince landowners of the benefits they can expect from implementing the Hill Approach, and that these benefits would justify some compromise on their part (with regards to the rights of tenant farmers). In the long term, legal changes to the roles and responsibilities of agricultural landowners that incentivize them to invest in their land, whilst respecting the rights of tenant farmers, would contribute to a transformation of agricultural land use in South Kivu.

1. INTRODUCTION

1.1 Background and objectives of the study

This study assesses the relevance, effectiveness, sustainability, and impact of the "Hill Approach" in South Kivu, DRC. This approach was developed by the USAID Bureau for Humanitarian Assistance (BHA)-funded, Mercy Corps-led Food Security Project (FSP) in 2017/2018 to address the interrelated challenges of land degradation, low crop productivity, and insecure land tenure on hills in the project's operating area.

FSP's development of the Hill Approach has been supported by the SCALE (Strengthening Capacity in Agriculture, Livelihoods, and Environment) initiative, which works to strengthen the impact, sustainability, and scalability of BHA-funded agriculture, natural resource management, and off-farm/non-farm livelihood activities in both emergency and non-emergency contexts. SCALE partners with food security implementers and the broader research community to capture, generate, apply, and share knowledge to foster more resilient agricultural systems and enhance income opportunities for the world's most vulnerable.

Mercy Corps' Resilience Design in Smallholder Farming Systems (RD) Approach[1] guides farmers and communities in adjusting their farm design in ways that work with the surrounding natural systems, improving soil health and water management, while bolstering resilience to future shocks and stresses. In FSP, Mercy Corps and partners implement the RD approach on hills, creating the Hill Approach, and work with 18 landowners and up to 150 tenant farmers per hill on techniques to decrease soil erosion, enhance soil health, and ultimately increase yields whilst addressing the challenge of insecure land tenure.

This report summarizes the findings of a study carried out in May and June 2022 (see Scope of Work in Annex 1) with the aim to document and evaluate the Hill Approach, identify its strengths and weaknesses, and propose ways of improving it. It is intended for NGOs, research institutes, government agencies, and funders interested in replicating the approach, either as part of a wider food security, sustainable agriculture, or environmental restoration initiative, or as a standalone approach.

1.2 Food security, agriculture, and environment in the FSP operational area

South Kivu is a province located in the eastern part of the Democratic Republic of Congo (DRC). FSP has been working in Miti Murhesa, Katana, and Kalehe, three health zones located in the territories of Kabare and Kalehe in the north-eastern part of the province, nested between Lake Kivu in the East and Kahuzi-Biega National Park in the West. At altitudes between 1,300m and 2,225m, the landscape in these zones consists of hills, valleys, and plateaus, with an average rainfall of 1,500mm to 1,800mm per year. The soils in both zones are very poor and prone to water erosion due to the steep slopes. Most of the land belongs to large landowners, the majority of whom live in cities in the DRC or abroad, with tenant farmers hiring plots from them (normally via a local manager) to farm. There is land scarcity in these zones because of population growth, an influx of migrants, and land degradation that results in a reduction of land suitable for cultivation.

1 See Mottram et al. 2017 for details of the Resilience Design Approach: https://www.fsnnetwork.org/resource/resilience-design-smallholder-farming-systems-approach

Cassava is the main food crop in the area.

According to Mercy Corps (2017a), the average area of land each household cultivated was around 5,000m2 in 2015, with the principal household income coming from agriculture (75%), livestock rearing (13%), and small businesses (10%). Agriculture is the principal activity, with households growing for both household consumption and sale – provided they can produce a surplus. The main crops grown on the hills are cassava, beans, maize, sweet potatoes, groundnuts, yam, taro, sunflowers, sorghum, and soya beans. In the valleys, bananas, sugar cane, rice, potatoes, and a wide range of vegetables are cultivated.

Food security has been affected by high rates of population increase, ongoing armed conflicts in the area, and the absence of effective agricultural advisory services. Already in the early parts of the 21st century, there was a chronic deficit of food in South Kivu, which Crawford et al. (2008) attributed to low soil fertility and a shortage of off-farm income-generating opportunities:

> ***High population density has transformed the countryside into a patchwork of small parcels where soils are no longer left fallow. In addition, a feudal land tenure system persists, which dictates ownership and use of the land. (…) Control of most of the land in South Kivu is hereditary, which favors the customary power of the "modern" authorities of the state. This situation discourages soil conservation, encourages manual labor, and results in severe soil erosion. The lack of availability of chemical fertilizers, improved varieties, and crop protection products means that the only method available to most farmers in South Kivu to improve acid soils is the use of organic matter.***

A Comprehensive Food Security and Vulnerability Assessment (CFSVA) conducted in 2011-2012 by the World Food Programme (2014) showed that 64% of the rural population in South Kivu was food insecure, Kalehe and Kabare ranking respectively at the 3rd (72.2%) and 4th (70.8%) positions over the 12 South Kivu territories. Since then, the impacts of climate change have further affected food security, with long dry spells during the rainy season leading to farmers losing their seeds, and increased intensity of thunderstorms and hail which damages crops, leading in some cases to complete crop loss.[2] A sample survey carried out by the South Kivu office of the WFP in 2019 found that 80.2% of households in Kalehe and 79.1% of households in Kabare were moderately or severely food insecure (WFP 2019), with 73.6% of households in Kalehe and 80.1% of households in Kabare spending more than 50% of household income on food – despite these being rural districts.

The IPC (International Food Security Phase Classification) Food Security and Nutrition Snapshot classified Kabare as "Critical" in terms of acute malnutrition, and Miti Murhesa as serious (2021), attributing this to persistently high levels of acute food insecurity.

To improve agricultural productivity, farmers are using a range of soil and water conservation (SWC) methods,[3] documented recently in a study by Chuma et al. (2022). Soil erosion occurred on 76% of 257 surveyed farms in Kabare. Farmers were aware of 11 SWC techniques (originating from both local knowledge and training by various projects), but only six of these techniques were routinely implemented on farms: mulching (36% farms), continuous or tied ridges (26% farms), hedges (19% farms), channels and drains (10% farms), infiltration ditches (4% farms), and terraces (2% farms). However, the study only included a relatively small proportion of tenant farmers (less than 14%), which may explain the relatively widespread use of SWC on the farms surveyed.

On tenure farms where occupancy is not secure, investments in SWC are generally lower than on owner-operated farms. This has been widely documented globally, including in Sub-Saharan Africa (see e.g., Lovo 2016). Whilst food security depends on both food availability and access, the link between insecure land tenure, insufficient investment in SWC, reduced soil quality, and reduced yields was documented during the assessment of "Shocks and stresses related to agricultural practices" undertaken by Mercy Corps in 2017 (2017a), which led to the design of the Hill Approach. Under this approach, Mercy Corps and partners implemented, on a pilot basis on 18 hills in the FSP operational area, several integrated strategies to tackle the inter-related challenges of land degradation, low productivity, and tenure insecurity (see section 2 for details).

1.3 The FSP project

The South Kivu Food Security Project (FSP) is a five-year initiative implemented by Mercy Corps and its partners. It is funded by the United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA) and supports USAID's strategic objectives for the Democratic Republic of the Congo (DRC) by working with households, community leaders, the government of the DRC, and other development programs in pursuit of the project's goal of improved food and nutrition security and economic well-being of vulnerable households in South Kivu.

To meet its goal, the project implements activities under three key purposes:

- P1: Household incomes increased
- P2: Improved nutritional status in targeted communities
- P3: The socio-economic environment is stable and inclusive

The five main project partners are:

- World Vision, operating in Kalehe, as both the main sub-partner and the lead on health interventions.
- Harvest Plus, who supplied bio-fortified seeds at the early stages of the project.
- Université Evangélique de l'Afrique (UEA), leading activities related to soil fertility management and erosion control and providing technical leadership to implement the Hill Approach.

2 Several of the hills visited for this study had been affected by hail during the earlier part of 2022, with farmers reporting near complete losses on exposed fields, in particular when beans were hit during the flowering stage.

3 The paper uses the term SCT (Soil Conservation Techniques) rather than SWC measures, but SWC is the more widely used and appropriate term to describe the techniques concerned, which aim to conserve both water and soil.

- Action pour la Paix et la Concorde (APC) leading on conflict management interventions, with an emphasis on securing land access for tenant farmers.
- Reseau Inter Organisationnel (RIO), in charge of literacy activities for women and safe spaces for young adolescents.

Operating in the three Health Zones of Miti Murhesa and Katana (Kabare territory) and Kalehe (Kalehe territory - see Figure 10 for location) and with a resilience approach, FSP aims at improving the coping mechanisms of communities and households in South Kivu and expects to reach approximately 35,000 households (230,000 people) living in 24 Health Areas, with specific attention paid to women and youth between 12 and 24 years old.

In 2021, FSP was granted a no-cost extension of two years until September 2023 to implement a handover and ensure sustainability. This study is part of the activities implemented during the extension phase, aiming to document and share lessons from one component of FSP, the Hill Approach.

The Hill Approach is a relatively small component of FSP, managed jointly by P1 and P3, to address the specific challenges of land access and opportunities on those hills in the area belonging to large, often absent landowners, and that suffer from soil erosion and land degradation.

1.4 Evaluation approach and methods

This evaluation of the Hill Approach focuses primarily on four of the six globally recognized dimensions of development evaluation (OECD DAC 2020):

- **Relevance:** Is the Hill Approach doing the right things, i.e., is it responding to the main challenges and needs of the target group?
- **Effectiveness:** Is it achieving its objectives?
- **Impact:** What (positive or negative) difference is it making?
- **Sustainability:** Will the benefits last?

Coherence and efficiency were not explicitly addressed in the evaluation, as the Scope of Work (Annex 1) emphasized impact, sustainability, and replicability. For each evaluation criterion, several indicators were defined, and sub-questions were formulated on these indicators. Checklists were then developed to obtain information on each indicator (see Annex 5 to Annex 7), and the resulting information was analyzed by tabulating responses and summarizing narratives by pre-defined headings.

FIGURE 1: EVALUATION CRITERIA FROM OECD DAC

Source: OECD DAC (2020)

The evaluation used the following methods:

- **Review of project documents and data.** About 130 project documents were made available for review, including FSP project reports, partner reports on the design and implementation of the Hill Approach, the results of soil analysis on the hills carried out by UEA, as well as maps and photographs from the hills (some of which were taken with drones by UEA researchers, showing the situation on the hill before and after the interventions).[4] The consultant additionally identified about 20 relevant studies and reports from other sources, including research papers.
- **Meetings and workshops with FSP staff.** The consultant held three workshops with FSP staff (Mercy Corps and partners) in Bukavu, as well as a range of one-on-one discussions with individual staff involved with the Hill Approach. During these workshops, findings from the document review were discussed and clarified, the field activities were planned, further information not available in the project documents was sought, and the findings from the field visits and emerging recommendations were discussed.
- **Site visits to nine out of 18 hills:** The consultant, accompanied by Mercy Corps and partner staff for assistance and interpretation, visited half of the hills covered by the Hill Approach between 13 and 25 May 2022. On each hill, the following activities were carried out (see checklists in Annex 5 to Annex 7):
    a. Checklist-guided Focus Group Discussions (FGD) with female tenant farmers.
    b. Checklist-guided Focus Group Discussions (FGD) with male tenant farmers (in parallel to a) above – with one FGD held by the consultant with an interpreter, and one by a Mercy Corps staff member not involved in the Hill Approach implementation).
    c. Checklist-guided Focus Group Discussions (FGD) with COCOVE (Green Hill Committee – see Box 1) members (but without the landowner or land manager).
    d. Key informant interview with landowner or land manager (again in parallel to c) above)
    e. Transect walk across the hill with some tenant farmers

BOX 1: GREEN HILL COMMITTEES (COCOVE)

The *Comités de Colline Verte* (COCOVE), or Green Hill Committees, are an essential part of the Hill Approach. Most of the members of the committee are elected from amongst the tenant farmers on the hill, and in addition, the committee includes the landowner (or land manager) of the hill, as well as the local village chief. See Annex 8 for details of the roles and responsibilities of the COCOVE.

- **Meeting with village heads:** A four-hour session was held on May 26, 2022, in Katana with village heads from seven of the 18 hills to discuss their perceptions and assessment of scaling out opportunities.
- **Internal FSP validation meeting:** Analysis of information, presentation of findings and recommendations to FSP, report writing
- **Stakeholder workshop:** A workshop was held in Bukavu on June 2, 2022, with representatives from local government, the provincial ministries of agriculture and environment, research institutes, civil society organizations, and development agencies to present and discuss the findings and the potential for scaling out the approach more broadly in the region. The emerging suggestions are shown in Annex 11.

4 Unfortunately, the drone ceased to work in 2019, and hence the only more recent images of whole hills/hillsides are from publicly accessible satellite images (Google Earth). Many photos were taken of specific locations on the hills, but not systematically at the same time of the year and on the same location with the same angle, which makes a 'before-after' comparison difficult.

FIGURE 2: FOCUS GROUP DISCUSSIONS, KEY INFORMANT INTERVIEW, AND TRANSECT WALK

There are limitations to the approach and methods used, which influence the representativeness and rigor of the findings. Specifically:

- The consultant and assistants spent only 4-6 hours on each hill due to the time required to travel and restrictions with regards to evening driving, which did not enable the team to see the whole hill, let alone visit tenant farmers' own fields to assess replication of practices.
- The FGD involved only about 5% to 20% of tenant farmers, who had been mobilized by the COCOVE members. It is likely that those farmers who showed up are the ones who are more interested in and motivated by the project, and hence may not be representative of all farmers on the hill.
- Because most landowners do not live on the hill, the team spoke mostly to the land managers (in six out of nine cases). Some of the managers had not been in charge of the activities on the hill when FSP started, and, while they were aware of the general situation on the hill before FSP, they did not have specific information about, for example, the area under cultivation or the number of tenants at that time.
- As no baseline data had been collected by FSP, the team had to use recall to find out what the situation (e.g., in terms of crops grown, soil quality, yields) had been prior to FSP (in 2018/2019). It is possible that farmers are not able to remember what things were like three to four years ago.
- Information collected was on tenant farmers' and landowners' perceptions of change, and no measurements of any kind were taken. It is possible that perceptions were influenced by tenants' and landowners' expectations of further benefits from FSP, resulting in a confirmation bias (whereby responses tend to be positive about the activities implemented and their replicability). In a few instances, the interpreter confirmed that people in the FGD discussed what the "right" answer should be – the answer that was expected by the interviewer.
- On the other hand, farmers were eager to point out that they require further support – a phenomenon very common in situations of protracted relief, where participants develop a dependency on interventions.

2. RATIONALE, ELEMENTS, AND STAGES OF THE HILL APPROACH

2.1 An integrated approach to respond to multiple challenges

During the first year of the FSP project, a range of studies were undertaken to analyze the main challenges, shocks, and stresses faced by the population in the two health zones where the project was to operate. These included (a) an analysis of shocks and stresses related to agricultural practices (Mercy Corps 2017a), (b) an analysis of land security and conflicts (Mercy Corps and APC 2017) and (c) a report on erosion control practices and the determinants of their adoption (UEA 2017).

The STRESS studies by Mercy Corps identified poor farming practices as a contributory factor to low yields, including:

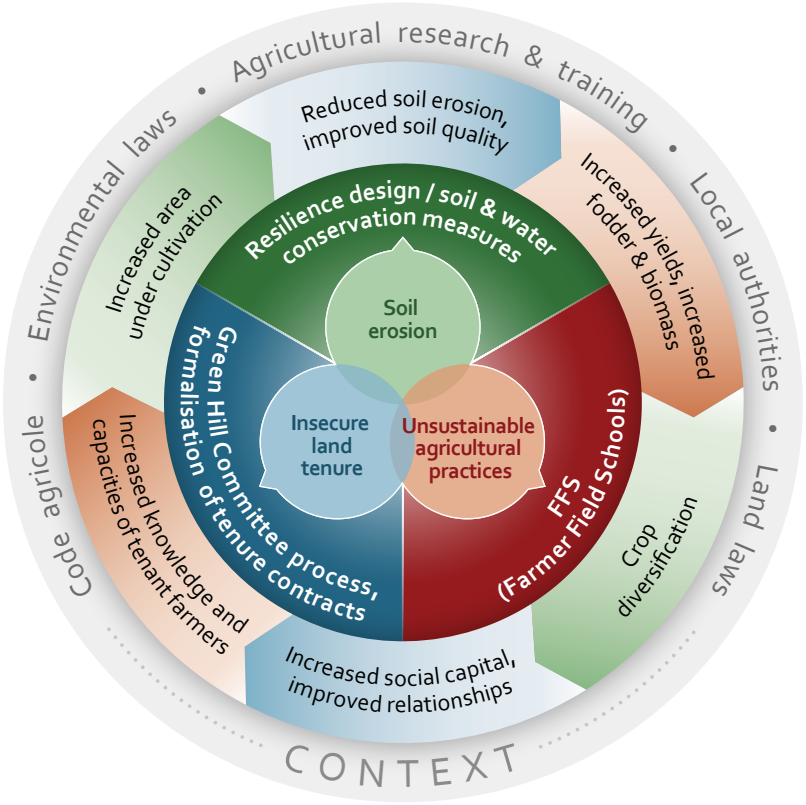
- Use of varieties poorly adapted to the context or low yielding (e.g., cassava varieties not resistant to Cassava Mosaic Disease (CMD))
- Farmers not following the recommended cropping calendar with timely land preparation, sowing, weeding, etc.
- Low levels of knowledge and understanding about pest and disease control, production and use of organic manures, processing, storage, and marketing of produce
- Crop theft and livestock damage to crops also contributed to low production and food shortages.

They pointed to the need for an **integrated, holistic approach** that can address the interconnected challenges of land degradation, low productivity, and tenure security on the hills through complementary interventions. Specifically, the need to implement SWC measures not just at the farm level, but at the level of a watershed or hill, was identified as a key factor to bring about lasting impact.

Eroded hillside at Mpinga 1

During discussions between FSP partners in South Kivu it was agreed that FSP would pilot such an approach, subsequently coined the "Hill Approach," which integrated the experiences and capacities of all FSP partners. It builds on the Resilience Design in Smallholder Farming Systems Approach (RD Approach) developed by the USAID-funded Technical and Operational Performance Support (TOPS) Program (Mottram et al. 2017) and now supported by the USAID/BHA-funded SCALE Award (www.fsnnetwork.org/scale), which has provided FSP with additional monitoring tools, resources, and mentorship support throughout implementation.[5] The RD Approach promotes principles and techniques for building healthy soils and improving water management to increase resilience to shocks and stresses. The Hill Approach adds to this a component focusing on securing land tenure for tenant farmers on the hills, working with landowners, tenants, and local authorities to reduce conflicts over land, negotiate formal and longer-term tenure contracts, and develop local capacities for collective action.

FIGURE 3: THE HILL APPROACH IN CONTEXT



Source: SCALE Award

It was subsequently agreed between FSP partners to pilot the Hill Approach on 18 hills, with 100-150 tenant farmers per hill. UEA was tasked with designing a management plan for each hill and potential SWC measures, APC took responsibility for the tenure security and conflict resolution component, and Mercy Corps and World Vision oversaw the on-farm component to improve farming practices via Farmer Field Schools (FFS) and the production of tree seedlings (agroforestry species supporting the SWC component and fruit trees) in nurseries.

Interviews with tenants and landowners on nine of the 18 hills confirmed that the approach addressed their main needs and challenges. Soil erosion caused by uncontrolled surface runoff was mentioned by all groups on all nine hills as a key constraint, which, according to them, led to:

- Soil erosion, removing organic matter from the soil, and contributing to poor soil quality/low soil fertility
- Crop damage from erosion (seedlings and seeds being washed away, roots being exposed)

5 See Love (2020) for an example of the mentorship support provided by SCALE.

- Reduced crop yields
- Inability to grow crops other than cassava

The four constraints above were already identified in the general studies carried out by FSP during the first year of the project.[6] In addition, farmers on the nine hills visited spoke about:

- Reluctance of farmers to invest in organic soil amendments/manure (considered to be a waste, as the organic matter will be washed away).
- Low demand for plots on the hill because of low soil fertility and crop damage from erosion, resulting in only a small number of tenants on some hills.
- Low proportion of the hill being cultivated/some hills used just for grazing.

Stabilized contour line

Tenant farmers had low crop yields, contributing to low income and poor nutrition (unless they had land in other parts). Erosion was the result of heavy rainfall, combined with cultivation and grazing on steep slopes without any SWC measures. Because of the topography of the hills and the rainfall regime, effective control of erosion would require collective action across plots, with SWC not confined to individual plots but extending to a whole hillside. Tenant farmers were reluctant to invest in SWC work because of low levels of tenure security and social organization on the hills.

FSP decided that the first priority was to stabilize the slopes, to ensure that the benefits of improved cropping practices (including the use of organic soil amendments) would not be undone by damage from erosion. Hence, during the first year of implementation, most effort was invested in developing the contour ridges and stabilizing them with agroforestry trees and hedge species. During subsequent years, the focus shifted toward the maintenance of SWC measures and soil enrichment with compost and organic matter.

6 An analysis of shocks and stresses related to agricultural practices (Mercy Corps 2017a), an analysis of land security and conflicts (Mercy Corps and APC 2017) and a report on erosion control practices and the determinants of their adoption (UEA 2017).

2.2 Main objectives and performance indicators

The objectives of the Hill Approach (after FSP 2019) are to:

- Reverse land degradation and protect soils from erosion.
- Increase and diversify agricultural production on the hills by improving the productivity of existing land and increasing the area under cultivation.
- Increase tenure security by having tenure contracts that defend the rights of tenant farmers, and that last at least 5 years without an increase in plot rent.

Together, these are expected to contribute to increased food and nutrition security of tenant farmers and increased household income. However, as the Hill Approach started after the FSP baseline data collection was carried out, higher-level outcomes (in particular food security and income) have not been systematically tracked on the hills. The seasonal agricultural sample survey of 500 households (carried out by FSP in its operational area overall) does not differentiate between farmland/plots on the 18 selected hills and elsewhere,[7] and can therefore not be used to track changes in agricultural productivity, land use, household food security, and income on the hills.

Monitoring of the Hill Approach focused instead on qualitative tracking of process and outcomes, in particular the progress of implementation of SWC measures on the hills, the emergence of the COCOVE, and changes in the number and type of tenure contracts. The following data and information on various aspects of the Hill Approach were collected by FSP partners (see also Annex 4 for data availability on proposed indicators):

- **Soil samples** were collected by UEA on three locations of each hill in 2018, 2019 (not all hills) and 2022. These were analyzed for pH (acidity), the content of organic carbon, organic matter, phosphorus, and nitrogen. The data is presented in section 3.1.2.
- The **types, numbers, and conditions of land tenure contracts on the hills** are recorded by APC, but the results vary significantly from the information obtained during the hill visits undertaken for this study (see section 3.1.5).
- APC also recorded the **number of conflicts** on the hills, but it is not clear how "conflict" was defined and what the nature of these conflicts was. Arguably, an increase in the number of conflicts is not necessarily a bad thing, as it could also be an indication that tenants are becoming more confident and insisting on their rights.
- In late 2021, FSP undertook a brief **Quality Improvement Verification Checklist (QIVC)** survey on the hills, with the aim of "assessing the quality of the Hill Approach and the practices that are implemented on the hills for an adaptive management of the FSP programme."[8] This survey involved interviewing two key informants from each hill (one tenant and one COCOVE member) on a range of topics related to the SWC measures implemented and their maintenance, adoption of agricultural practices, the relationship between tenant farmers and landowners and functioning of the COCOVE. The checklist covered a range of questions related to the performance of the COCOVE, but the representativeness of the responses is questionable, relying on only two informants.

FSP did not systematically collect data on the area under cultivation on each hill, crops grown/crop diversification, crop yields, level of adoption of the various practices promoted on the hills, the proportion of/area under SWC measures maintained and in working condition, household income, and household food consumption. This study, therefore, relies largely on the half-day visits to each hill, during which farmers' perceptions were recorded and some direct observations were made of the agricultural and SWC measures implemented (see also section 1.4 for limitations of this study).

7 Most tenants have at least some land near their homesteads (often referred to as "gardens"), as well as land on other hills or in valleys.

8 From "*Termes de Référence QIVC Approche Colline.*"

2.3 Watershed vs. Hill

FSP identified early on the need for an approach that (a) tackles soil erosion on a larger geographic scale than the individual plot (as water draining from a plot further up the slope will contribute to degradation on plots further down), and that (b) ensures that farmers are willing/motivated to invest in land management because they have secure land tenure. If (a) alone was considered, the conventional and well-tested approach to SWC is watershed management (WSM), whereby all land draining to a defined location along a stream or river is treated, following a "ridge to valley" logic. The principles of WSM can be applied at any scale, ranging from the catchment of a small stream to a major river basin. In many parts of the world (including India, China, the USA, and many parts of Africa and Europe), WSM has been the main approach to organizing natural resource management activities (and, in some cases, also socioeconomic ones). However, when also considering (b) – land tenure – as a key dimension, it becomes clear that a watershed is not the optimum unit of operation.

In the Kabare and Kalehe zones of South Kivu, large landowners normally own one or several hills of varying sizes, sometimes including the valley bottoms, and at other times just including the slopes/flanks of the hill. Because tenure security was identified in the STRESS report (Mercy Corps and APC 2017) as a key factor influencing farmers' willingness to invest in soil and water conservation, FSP decided to define the treatment area based on land ownership (hence, hills), not based on catchment areas.

Table 1 compares the two approaches along a range of criteria. In the context of South Kivu, where absentee landowners control a large proportion of the land on the hills, the Hill Approach seems to be the more appropriate strategy, as it emphasizes issues of control over land and natural resources as the starting point for change.

Unprotected hillside showing signs of soil erosion

TABLE 1: HILL APPROACH VS. WATERSHED MANAGEMENT

ISSUE	HILL APPROACH	WATERSHED MANAGEMENT
Determining factor for boundary	Land ownership ("concession," "plantation" belonging to one landowner)	Topographic (land area draining to one point)
Influenced by…	Land use and farming practices on neighboring hills that are part of the same watershed	Land use and farming practices on upstream watersheds
Emphasis on…	Socioeconomic factors (ownership of and control over land)	Environmental/biophysical factors (maximum reduction in erosion)
Interventions	SWC AND tenure security via capacity development and social mobilization AND improved agricultural practices	Normally SWC only
SWC measures used	These depend on the agro-ecological and socio-economic context and include a range of strategies to control surface runoff (check dams, gully checks, bunds, trenches, etc.), use of agroforestry species, soil amendments, etc. Both approaches normally follow a "ridge to valley" sequence.	

2.4 Stages of the Hill Approach

The Hill Approach, as piloted by FSP, involved a range of stages that follow a logical sequence, equivalent perhaps to a "Critical Path," with each step requiring some preparatory activities to be successful. In particular, it was realized early on that the collaboration and agreement of landowners, tenant farmers, and local chiefs would be required for the approach to be initiated and implemented. Some of these stages could be adapted or their sequence modified, as a result of insights from the pilot process.

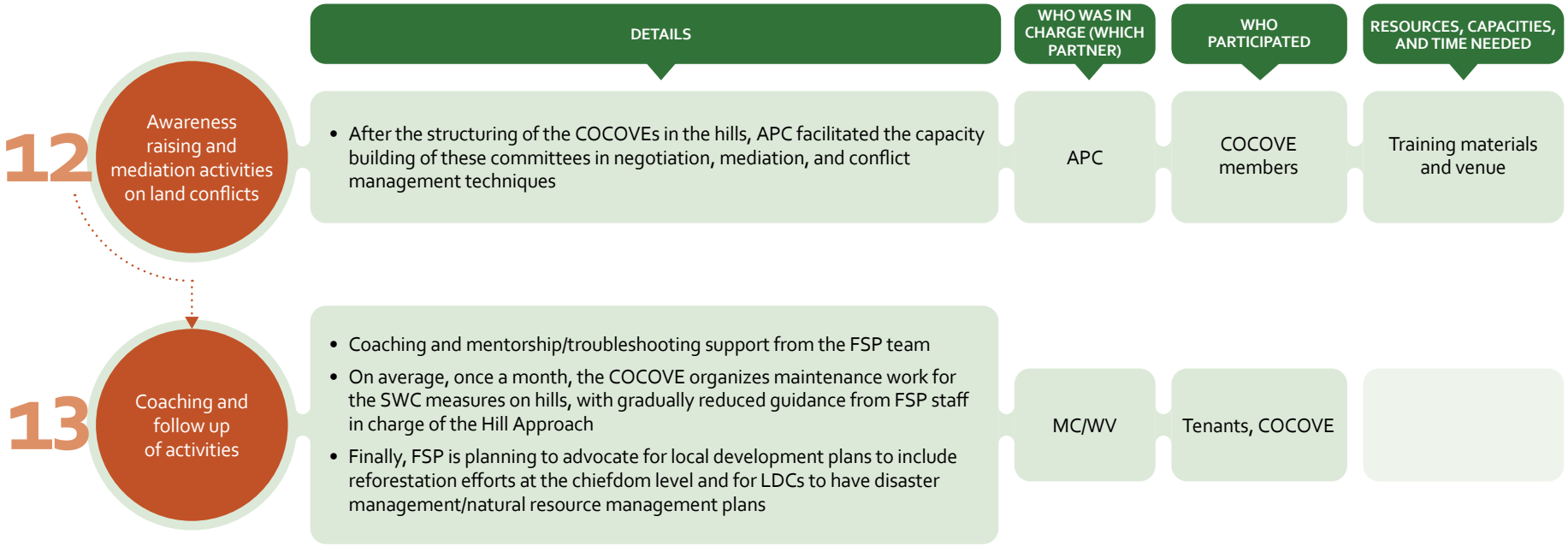
TABLE 2: STAGES OF THE HILL APPROACH

	DETAILS	WHO WAS IN CHARGE (WHICH PARTNER)	WHO PARTICIPATED	RESOURCES, CAPACITIES, AND TIME NEEDED
1 Meeting between FSP, the chiefdom, group leaders, and village chiefs	• Introductory meeting with local authorities in the FSP area on the challenges posed by land degradation, the methodological steps for implementing the Hill Approach, the proposed roles, and responsibilities for each actor • Ask permission for project staff to travel to the area to collect information about the hills	MC/WV	The chieftaincy, group leaders, and village leaders APC, P1, P3, COP, DCOP, UEA, Chef de base, SBCC	Presentation on soil fertility decline, good communication, clear and detailed methodology
2 Mapping and pre-identification of hills by health area	• Each staff member responsible for implementing activities in a health area is responsible for mapping a few hills that are susceptible to the Hill Approach • The mapping of hills suitable to the Hill Approach was carried out (a) using the CommCare application (collection of GPS coordinates, taking photos, and logging information on the location of the site), and (b) by interviewing guides (AVA, local chiefs) • Take pictures of the hills from different angles • Estimate the proportion under cultivation and the area suitable for SWC • Identify the number of tenants, the number and type of landowner(s), the location of the owner, and whether there is a local manager • Record level of degradation (low, medium, advanced, very advanced) and in which areas (top, middle, bottom of the hill) • Ask if the hill is a conflict area (if there are court issues on the hill)	FSP P1 (MC and WV)	Field staff P1 FSP	Camera for taking pictures, tablets with CommCare application
3 Feasibility study and final identification of hills	• Feasibility study and final identification of sites by UEA. UEA endorses or refuses the pre-selection done by P1, depending on what they consider can be rehabilitated • Taking images of the hills for analysis and design of treatment plan	UEA / P1	Staff P1 FSP	Technical expertise in the analysis and design of an erosion control management plan; equipment for taking pictures (camera, drone)

9 This was not done systematically for all hills, and the drone used for the original photos broke down in 2019 and was not replaced.

	DETAILS	WHO WAS IN CHARGE (WHICH PARTNER)	WHO PARTICIPATED	RESOURCES, CAPACITIES, AND TIME NEEDED
4 Hill design by UEA for each of the selected hills	• Proposal of the design for each validated hill (9 hills in 2018 and 9 others in 2019 in the territories of Kabare and Kalehe) • Photos of the hills finally selected in year 2 are archived (showing the hills in their state before the FSP intervention). Photographs are meant to be taken at different times of the agricultural season for several years)[9]	UEA	UEA team	
5 Meeting between FSP and the landowners of the selected hills to present the approach	• The design was presented to the landowners, and if they agreed to go ahead, an MoU (see Annex 6) was signed between the landowners, local authorities, and FSP • If landowners were not available, the land manager would need to have decision-making powers (delegated from the landowner)	MC/WV AND APC	FSP (P_1, P_3, COP, DCOP, SBCC) and selected landowners	
6 Presentation to the tenant farmers on each of the hills	• These are orientation sessions for the tenant farmers working on the hills selected by FSP on the steps and design for implementing the field approach	MC/WV/APC	Tenant farmers	
7 Establishment of FFSs	• On average each hill identified had 120 tenant farmers. These 120 were then structured into four FFS, with 30 participants per FFS • They received an induction on the techniques to be used for the implementation of the hillside approach (RD, SWC) and intensive training on resilient agriculture/permaculture	MC/WV	Tenant farmers	Technical capacity of staff in the field of RWH; Training modules and other teaching materials (flip charts, markers, notebooks, etc.)

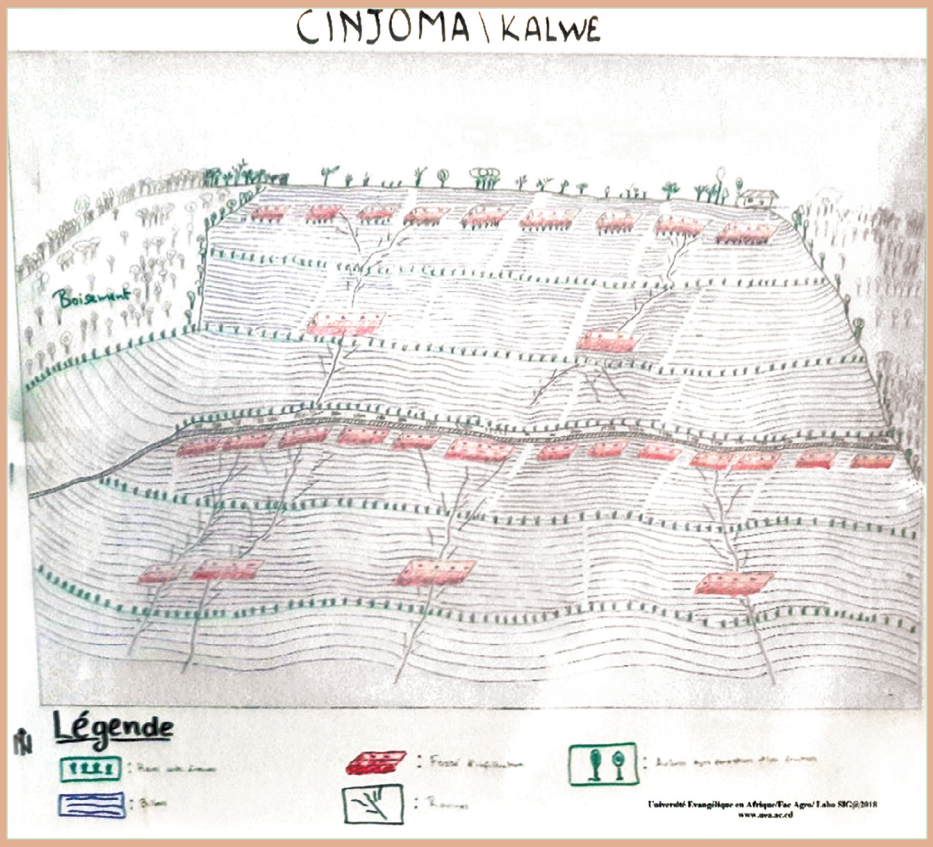
	DETAILS	WHO WAS IN CHARGE (WHICH PARTNER)	WHO PARTICIPATED	RESOURCES, CAPACITIES, AND TIME NEEDED
8 Establishment of the COCOVE by hill through election by FFS members	• Each FFS delegates two of its members to the COCOVE. There, each delegated member is then elected according to the different positions thus forming the COCOVE • The role of the latter is to ensure that the relationship between the tenant farmers and the landowners is maintained, and to monitor the maintenance of the erosion control system installed on the hill	APC	Tenant farmers	
9 Distribution of seeds, tools, and seedlings	• For the implementation of the activity, FSP provided each farmer with seeds (2kg of maize, variety "SAM 4 VITA," and 4kg of beans, variety "HM21-7") as well as farming tools (one hoe, one spade, and one trident) • Each POC also received 1300ml of cassava, variety "sawa sawa" for propagation in the group's field • This was done at the end of August and beginning of September (start of the main agricultural season)	Harvest Plus for seed production	MC/WV	Seeds + tools + seedlings
10 Launch of the SWC work on the hill with all tenants and the P1 staff	• The work was launched in all the selected hills • The work consisted of tracing the channels along the contour lines for SWC, planting *Tripsacum* (Gamagrass) and/or *Tithonia hedges* (tree marigold), as well as planting agroforestry trees (*Grevillea, Calliandra, Leucaena, Maesopsis, Cedrela, Podocarpus,* etc.) for stabilization and to restore soil fertility • Tenant farmers contributed organic matter for soil fertility	MC/WV, P1 staff	Tenant farmers, landowners, and UEA trainees	Approximately three stages of work, each lasting three consecutive days; manure, seedlings of agroforestry trees and hedging plants
11 On-the-job training throughout the agricultural season in the FFS	• Each farmer, through the FFS, received a capacity-building package including SWC, good farming practices on sloping land, market-oriented agriculture, etc.	MC/WV	Tenant farmers	FFS curriculum, demonstration field

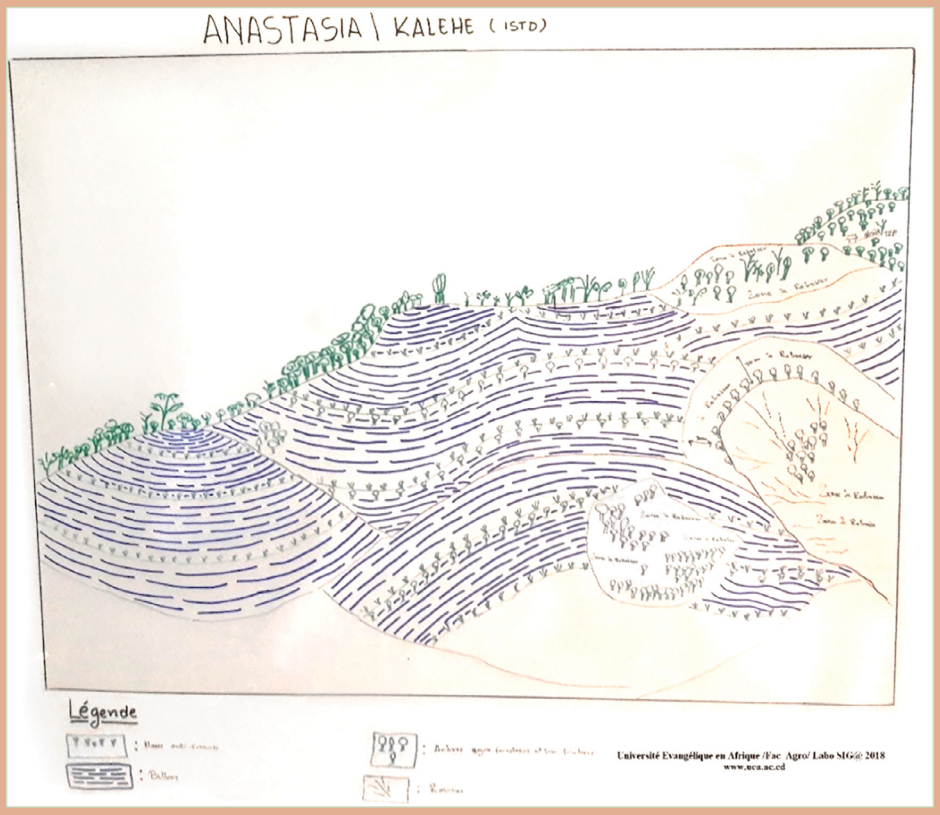


The rationale of these stages was to develop in parallel the physical structures on the hill (contour lines, hedges, trees) and the human and social capital to manage these structures and ensure their maintenance. The treatment plans for the hills developed by UEA were at the heart of the approach and included recommended SWC measures for each (see Figure 4 for examples). The plans would include the main landscape features (hills, valleys, water courses, existing tree cover/plantations) and proposed location of contour lines, and other water infiltration structures such as check dams, live hedges, etc.

Treatment normally followed a ridge-to-valley sequence, and landowners and tenants would have a say in the selection of the specific species (grasses, hedges, trees) used on the hill. Different species of multi-purpose agroforestry trees and shrubs were used and raised in FSP nurseries set up as part of the wider FSP project interventions.

FIGURE 4: TREATMENT PLANS FOR H1 (CINJOMA) AND H9 (ANASTASIA/KALEHE)





Source: UEA 2018

The SWC measures were implemented by tenure farmers, accompanied by FSP, but farmers were not paid any wages for this work. They did receive some snacks during the workdays, as well as tools (to be used for the SWC works, but also on farmers' own plots) and seeds, but essentially their labor was free. This is an important issue to keep in mind – this work was not done on a "food for work" or "cash for work" basis, but essentially as voluntary labor by the community. Despite other concerns about the sustainability and replicability of the approach (see section 4.3.5), the ability to mobilize tenants to work on the hill without payment is a good achievement, in a context where development interventions rarely expect inputs from the participants/beneficiaries.

BOX 2: *SALONGO*

On the hills in South Kivu, tenant farmers normally provide labor to the owners of the land that they cultivate, as partial or full payment for the right to cultivate the land. The local term used for this is *salongo* (Lingala for "collective work"). The farmers interviewed on the nine hills visited used the same term to refer to work they undertake for the implementation and maintenance of soil and water conservation works on the hills.

3. OPPORTUNITIES AND CHALLENGES OF THE HILL APPROACH

3.1 Changes brought about by the Hill Approach

3.1.1 INTRODUCTION

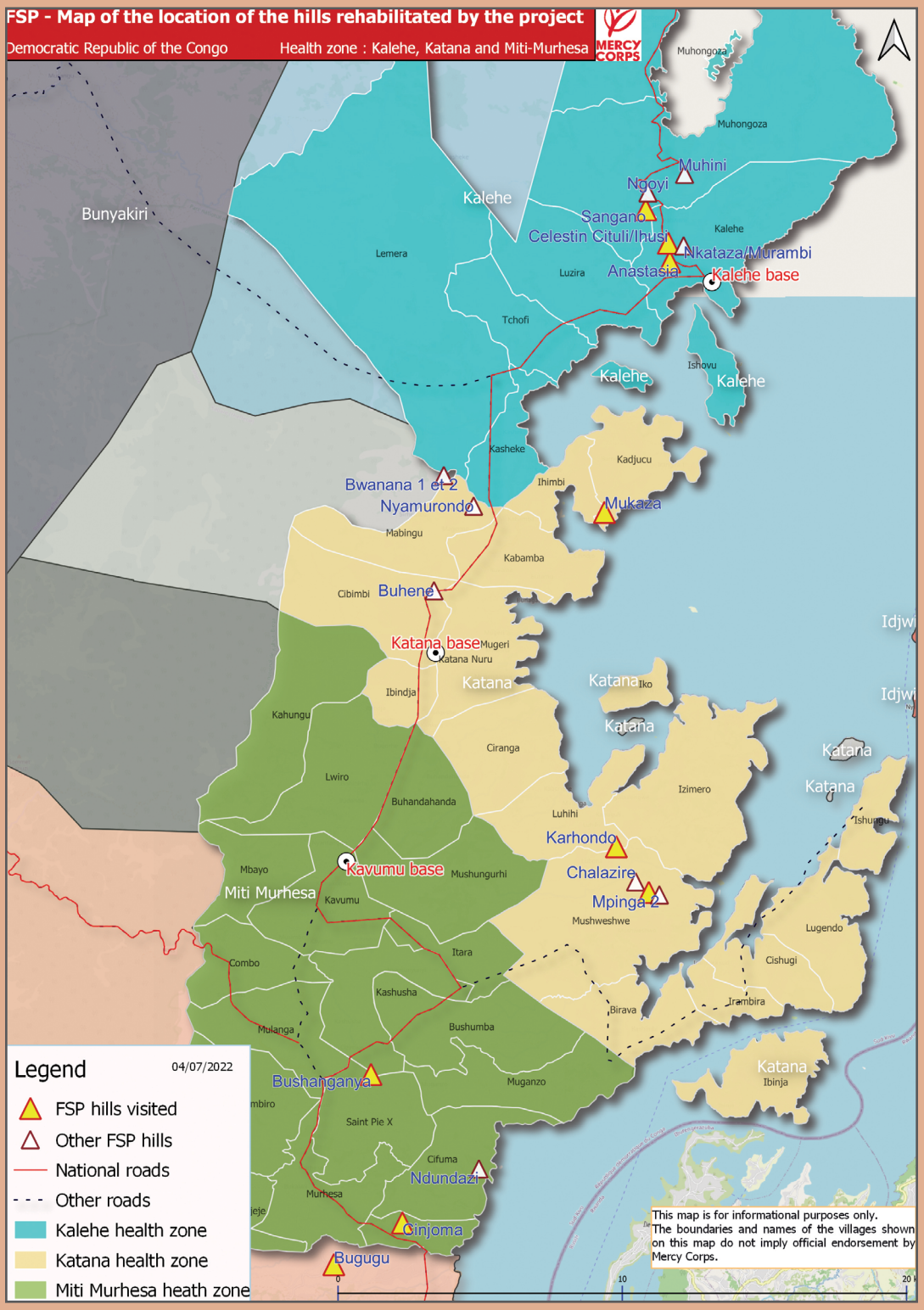
The assessment in this chapter is based on farmers' perceptions and own observations during visits to nine out of 18 hills in May 2022. During the hill visits, participating farmers were readily able to identify (almost exclusively) positive changes that the project contributed to or brought about in environmental, economic, and social terms.

Table 3 outlines the main types of impact and who benefited from them, using a basic grid of high, medium, and low benefits and high, medium, and low costs/disadvantages. This is based on the feedback from farmers on the nine hills visited. The different types of changes are explained in more detail in sections 3.1.2 to 3.1.7 below.

Where specific hills are referenced, the numbers refer to those 9 hills in the order they were visited (see Annex 2 for details and Figure 5 for a map showing the location of the 18 hills where the Hill Approach was piloted, including the 9 hills visited for this study):

- H1 – Cinjoma
- H2 – Bushanganywa / Kanonzi
- H3 – Bugugu
- H4 – Mpinga 1
- H5 – Karhondo
- H6 – Mukasa
- H7 – Sangano / Muziralo
- H8 – Celestin Cituli/Ihusi
- H9 – Anastasia

FIGURE 5: MAP SHOWING THE HILLS VISITED DURING THIS STUDY



Source: FSP

TABLE 3: MAIN CHANGES ASSOCIATED WITH THE HILL APPROACH

POSITIVE AND NEGATIVE CHANGES RESULTING FROM THE HILL APPROACH	MAIN MECHANISMS/INTERVENTIONS LEADING TO CHANGES	MAIN GROUP BENEFITING/LOSING						
		Tenants on the hill	Landowner	COCOVE	Farmers in the valley	Farmers on nearby hills	Livestock keepers	Community overall
1. ENVIRONMENTAL								
⊕ Reduced soil erosion	Adoption of SWC measures							
⊕ Increased soil quality on the hill	SWC and manure/compost application							
⊕ Increased vegetation cover and biodiversity on the hill	SWC, planting of trees and grasses, natural regeneration							
⊕ Improved micro-climate	Planting of trees and grasses							
⊖ Loss of some land for cultivation	Development of SWC measures along contour lines							
⊕ Reduced number of bush fires	Awareness raising via FFS, sanctions via COCOVE							
2. ECONOMIC								
⊕ Increased yields, due to....	Increased soil quality & use of improved cultural practices							
⊕ ... improved farming practices, including use of organic manures.	FFS (training)							
⊕ Increased incomes from crop sales for tenants	Increased yields, training in marketing							
⊕ Access to emergency cash from "*caisse sociale*"	Initiated on some hills by FFS and COCOVE							
⊕ Increased demand for land on the FSP hills, contributing to ...	Reduced erosion, increase soil quality, increased yields							
⊕ ...increased area under crop cultivation								
⊕ Increased number of tenants, resulting in ...								
⊕ ... increased income from tenure fees and...								
⊕ ... increased availability of labor for *salongo* for landowner								
⊕ Increased value of land	Reduced erosion, increase soil quality, presence of trees and fodder							
⊕ Increased availability of timber and fodder from the hill, resulting in an increased income to the landowner from these	SWC, increased crop yield (resulting in more crop residues for fodder), *salongo*							
⊕ (In some cases) Increased tenure fees for plots	Increased productivity, increase demand for plots							

POSITIVE AND NEGATIVE CHANGES RESULTING FROM THE HILL APPROACH	MAIN MECHANISMS/INTERVENTIONS LEADING TO CHANGES	MAIN GROUP BENEFITING/LOSING						
		Tenants on the hill	Landowner	COCOVE	Farmers in the valley	Farmers on nearby hills	Livestock keepers	Community overall
⊕ (In some cases) reduced tenure fees for plots	Advocacy of COCOVE, increased number of tenants							
⊕ Reduced crop theft	Awareness raising via FFS, sanctions via COCOVE and village heads							
⊕ Reduced livestock damage								
⊕ Crop diversification, contributing to…	Increased soil quality, increased productivity, FFS training on cultural practices, processing, and marketing; introduction of new crops via seed starter packs, increased incomes							
⊕ … improved diets of tenants & their families, and…								
⊕ … increased quantity and range of produce available in local market								
3. HUMAN, SOCIAL AND INSTITUTIONAL								
⊕ Increased knowledge of SWC practices	FFS training, exchange visits, etc.							
⊕ Increased knowledge about the establishment and use of agroforestry trees and fodder grasses	FFS training							
⊕ Increased knowledge of good farming practices	FFS training							
⊕ Increased knowledge about farming as a business, crop processing, and marketing	FFS training							
⊕ Increased ability to negotiate, mediate and address conflicts	Training of COCOVE members							
⊕ Increased awareness of the role of women in agriculture and women leadership	Training of COCOVE members							
⊕ Increased social capital between farmers and between farmers and landowners/managers	FFS formation, COCOVE, and AVEC formation							
⊕ Changes in attitudes, confidence, and other intangible attributes.	FFS training, project experience overall							
⊕ (In some cases) increased tenure security due to written contracts	COCOVE interventions							

LEGEND

⊕ Positive change ⊖ Negative change High benefit Medium benefit Low benefit Some loss/disadvantage No change

3.1.2 ENVIRONMENTAL CHANGES

These include changes to natural resources on the hills that were observed by farmers, and that do not necessarily translate directly into economic gains.

✓ Reduced soil erosion

This was mentioned by all tenants and landowners on all hills as a major improvement, directly attributed to the project interventions. Tenants described how seeds, cassava cuttings, and even established crops would be washed away by heavy rains, resulting in near total crop loss. Topsoil and organic matter would be eroded, often leaving just the infertile subsoil. On some hills (e.g., H6), the soil was completely void of any vegetation, but these areas are now gradually covered with grasses.

In some cases, erosion resulted in damage to the fertile land at the valley bottom, which has reduced since the SWC measures were implemented. However, on H8 the manager believes that the SWC measures have increased the groundwater levels on the hill and in the valley, resulting in more water at the valley bottom from springs. This is being managed by additional drainage channels in the valley.

The reduction in erosion resulting from the SWC measures, combined with (in some cases) more secure land tenure, has incentivized farmers to invest in organic matter application (farmyard manure, compost), increasing soil quality over time. However, there are also external factors affecting erosion levels. On H1, the selling of plots of farmland for the construction of houses on neighboring hills has increased the level of erosion, affecting H1, and even leading to tenants abandoning their plots.

✓ Increased soil quality on the hill

Farmers commented that the soil used to be red or pale, dry, with the surface often hard and difficult to work with. As a result of the SWC measures and subsequent use of organic fertilizers, the soil is now becoming darker, damper, and softer. Water used to run off the hard soil surface, whereas now water tends to infiltrate, with much lower surface runoff. The landowner of H4 said that:

> ***...before FSP, the hill was a desert. There was only livestock grazing on it. Now, thanks to the SWC measures, there are many tenant farmers on the hill.***

On all hills, tenants and land owners attributed the improvements in soil quality to the SWC measures, which reduced erosion and encouraged farmers to apply organic matter (rabbit, goat, and cattle dung, compost, green manure) to their plots – something that most of them considered useless earlier, as any organic matter applied would be washed away.

Tenants are aware that soil quality improvement is a long-term process that will require regular maintenance of the SWC measures and continued application of organic soil amendments. They estimate that it will take between two and 10 years for the land to achieve its full potential, with trees having matured by then and the hill slopes having completely stabilized.

UEA undertook soil samples on the hills in 2018, 2019, and 2022 to assess changes in soil quality (see results in Table 4). Whilst no significant improvement can be expected between 2018 and 2019 (with most of the SWC work being implemented only in 2018), it is surprising that there have not been more improvements between 2019 and 2022, in particular with regards to soil organic carbon and organic matter (which should show an increase as a result of reduced soil erosion and increasing use of organic matter, as indicated by the tenants). The UEA researcher in charge of the soil analysis pointed out that there is strong competition for organic matter between use as a livestock feed or as a soil mulch/compost ingredient, and it is likely that farmers use less compost and mulch than recommended because of this competition. Also, changes in soil composition take time and three years is still a relatively short period to observe significant effects.

TABLE 4: RESULTS OF SOIL SAMPLES TAKEN FROM THE NINE HILLS VISITED

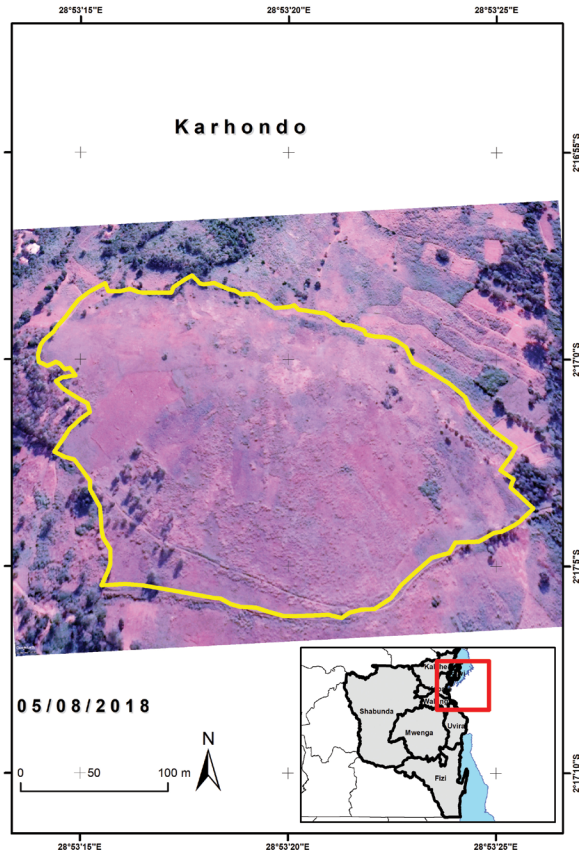
PARAMETER	LOCATION ON HILL WHERE SAMPLE WAS TAKEN	MITI MURHESA									KATANA									KALEHE								
		CINJOMA			BUSHANGANYA			BUGUGU			MPINGA 1			KARHONDO			MUKAZA			SANGANO			CELESTIN CITULI			ANASTASIA		
		2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022	2018	2019	2022
pH-water	Valley	6.26	6.04	5.9	6.2	5.9	5.9	6.1	6.1	6.4	5.5	6.0	5.7	5.8	5.8	6.1	5.3		5.6	5		5.1	5.8	6.03	5.8	5.1	5.8	6.1
	Mid-slope	6.62	6.04	6.1	6.22	5.8	4.9	5.5	5.7	6.7	5.1	5.8	5.9	6.07	6.7	6.7	5.6		5.6	5.5		6.5	5.7	5.9	5.8	6.12	5.7	6.4
	Top	6.54	6.07	6.07	6.32	5.8	5.1	5.5	6.03	6.4	5.0	5.7	5.8	5.7	5.7	5.9	5.1		5.9	5.8		6.0	6.2	5.9	6.1	6.13	6.07	6.4
Organic carbon [%]	Valley	2.05	1.91	2.09	2.15	1.8	2.1	2.6	1.79	2.09	2.2	1.7	1.7	1.86	1.74	1.8	2.27		2.55	1.45		1.82	2.96	3.2	3.2	0.98	1.04	1.59
	Mid-slope	1.92	1.61	1.44	1.99	2	1.56	2	1.77	1.71	2.0	1.1	1.1	2.6	1.92	2.03	2.27		2.27	2.13		2.13	3.7	2.8	2.8	1.05	1.06	1.7
	Top	1.76	1.74	1.71	1.79	1.9	1.37	2.4	1.77	1.44	2.0	1.6	1.06	1.74	1.77	1.6	2.5		1.95	2.09		1.92	3.6	3.6	3.75	1.92	1.1	1.1
Organic matter content [%]	Valley	3.57	2.82	3.6	3.73	2.8	2.52	4.4	3.1	3.59	3.7	2.8	2.92	3.19	3.0	3.1	3.9		4.38	2.5		3.55	1.72	1.83	3.74	1.69	1.79	2.73
	Mid-slope	3.32	2.76	2.5	3.4	3.4	2.68	3.5	3.02	2.94	3.4	1.9	1.9	4.5	3.3	3.5	3.9		3.78	3.98		3.67	2.15	1.61	4.8	1.8	1.83	2.92
	Top	3.06	3.01	2.92	3.08	3.2	2.39	4.1	3.02	2.48	3.4	2.8	1.87	3.02	3.05	2.75	4.8		3.35	3.6		3.3	1.72	1.72	6.45	3.3	1.75	1.75
Available Phosphorus [ppm]	Valley	20.03	19.8	18.2	23.2	14	14.1	18	15.6	15.7	11.7	12.4	12.4	12.5	12.5	12.5	13.9		13.9	11.7		11.7	20.1	21.75	21.75	21.78	21.8	24.2
	Mid-slope	19.39	12.4	13.7	16.1	13	12.4	11	13.4	14.8	10.6	12.8	12.8	13.2	13.2	14.1	12.5		13.9	14.5		14.9	21.32	12.4	14.2	18.51	13.2	14.2
	Top	18.03	12.9	12.9	19.3	14	14.0	16	12.3	11.9	12.8	13.8	13.9	12.2	12.2	12.2	11.8		10.1	17.3		17.4	25.36	13.3	14.2	22.36	12.8	14.2
Nitrogen [%]	Valley	0.3	0.6	1.2	0.3	0.8	0.6	1.7	1.7	0.5	0.9	0.7	0.8	0.74	0.72	0.9	0.79		0.8	0.65		0.67	0.28	0.75	0.75	0.26	0.75	1.1
	Mid-slope	0.3	0.7	0.8	0.3	0.6	0.8	0.6	0.7	0.9	0.8	0.6	1.1	0.68	0.78	1.2	0.79		0.6	0.89		0.89	0.29	0.7	1.2	0.26	0.75	0.75
	Top	0.3	0.7	0.5	0.3	0.7	0.7	1	0.8	1.2	0.8	0.6	0.5	0.72	0.75	1.2	0.87		1.1	1.7		1.7	0.28	0.75	0.86	0.28	0.7	0.7

Color code for changes (as compared to previous sample):

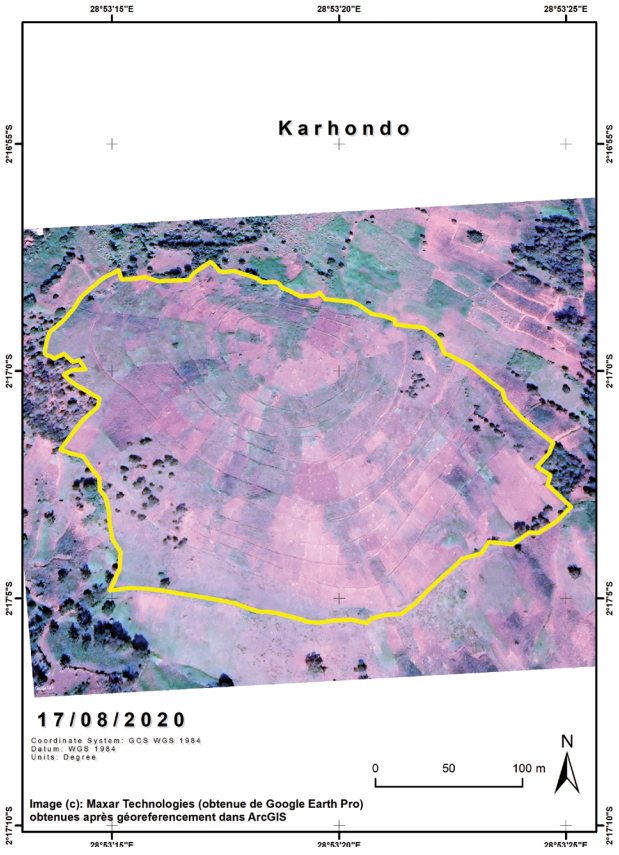
Degradation No change Improvement

FIGURE 6: KARHONDO HILL BEFORE AND AFTER FSP

BEFORE



AFTER



Source: Google Earth images, overlaid with hill outline. UEA / Géant Chuma

Source: Drone photograph taken by FSP team

✓ Increased vegetation cover on the hill

This was mentioned by tenants and landowners on several hills and is also clearly visible from the aerial photographs taken by UEA researchers and from Google Earth satellite images (Figure 6). Tenants commented on the "greenness" of the hills, sometimes pointing to neighboring hills that were partially denuded. There were previously few trees on the hills (sometimes only eucalyptus trees planted by the landowner to sell as timber), and on H8, attempts prior to FSP to plant trees failed altogether due to poor soil quality.

✓ Improved micro-climate

Several tenants and landowners commented on the improved micro-climate on the hill, which is overall cooler now, whilst trees act as windbreakers during times of strong winds and may mitigate some of the negative effects of hailstorms.

✓ Loss of some land for cultivation

The quite substantive channels and hedges/berms on the contour lines have reduced the area that can be cultivated. On most hills, this does not seem to be an issue, as farmers estimated that the area rehabilitated was generally larger than the area "lost" to SWC measures. Also, the contour channels and bunds provide additional benefits in the form of livestock fodder and green manure for the fields.

✓ Reduced number of bush fires

Tenants and landowners on some hills said that farmers stopped burning crop residues on the hill and that incidences of bush fires (often started by livestock keepers, to bring about a flush of new grass) have reduced. This was attributed to social organization and collaboration with village heads, who enforce sanctions on those who do not comply. However, during the transect walks, farmers burning residues were observed in several locations and it is not clear to what extent the burning of residues has really reduced. On H9, a large bush fire destroyed vegetation on the lower and middle slopes of the hill in 2019/20, and this area is still covered with *Imperata cylindrica* grass (and not cultivated).

3.1.3 ECONOMIC CHANGES

✓ Increased yields

All tenants and landowners on all hills said that crop yields (production per unit area) have increased, as a combined result of the SWC measures and improved cropping practices (use of organic soil amendments). However, no baseline data is available for any of the main crops grown (cassava, maize, beans), and farmers' estimates vary widely between and within hills (i.e., between different groups interviewed on the same hill). Reliable estimates were also difficult to obtain because plot sizes vary from hill to hill, with a "standard" plot of one *carré* or *piquet* being defined as variably 20mx40m, 25mx40m, or 25mx50m. Most farmers would not know the size of their plot, and nor would they necessarily keep track of the amount harvested (in standard units, such as 100kg bags).

Tenant farmers on all hills estimated that a further increase in crop yields is feasible, provided that SWC measures are maintained and that there is the continued use of improved cultural practices, in particular, the application of soil amendments.

In cases where tenants are able to pay in kind (e.g. H9), the land owner benefits directly from an increase in productivity, as he/she receives a fixed proportion of the harvest (50% on H9)

✓ Improved farming practices

Tenant farmers on all hills appreciated the knowledge gained from the FFS trainings and demonstrations. They referred to the importance of timely land preparation, sowing/planting and weeding, crop rotation and intercropping, the use of organic soil amendments, pest and disease control, crop processing and marketing, etc. However, it has not been possible to assess the proportion of farmers applying these practices on their plots on the hill or on other plots outside the hill. During the transect walk, a mix of practices could be observed, including the use of crop residues such as mulch and intercropping. However, planting density was normally much higher than recommended for cassava and maize, and there was a high incidence of CMD with farmers not being aware of phyto-sanitation practices (destruction of infected plants). It was not possible to verify the extent to which farmers did use different practices on their other plots and there was a clear confirmation bias when asking this question, as farmers were aware that the project would like them to apply practices on all their fields.

Compost structure on cassava field

FSP training for Hill Approach farmers included an emphasis on the use of organic soil amendments and their benefits. Farmers were trained in compost making using livestock dung, crop residues, weeds, and leaves branches from agroforestry trees and hedges. Farmers were already used to making and applying compost to their gardens (small fields near/around their homestead), but not to do it at scale on the hills.

Farmers who had plots outside the FSP hills said that the soil quality on these other hills is generally better, but the plots are generally smaller and more expensive (higher tenure fee).

✓ Increased incomes from crop sales for tenants

Some tenant farmers on five out of the nine hills visited said that the increase in production (because of SWC measures and improved cultural practices) has enabled them to sell a proportion of their produce and use the income for essential expenses (school fees, medical emergencies) and to invest (in particular in small livestock, but also other businesses and construction projects). They learned about the principles of market-oriented agriculture from the FFS (including how to track production costs, how to plan for the sale and divide produce into the part for family consumption, the part to sell and the part to keep for seeds, and some basic knowledge on post-harvest operations). However, it was not possible to estimate what proportion of tenants on the hills increased their incomes due to increased crop sales.

✓ Access to emergency cash from social funds

Emergency funds were initiated on some hills by the FFS and COCOVE, usually via a shared field and/or regular contributions to the fund by all tenants. These funds were made available to tenants who found themselves in a difficult situation, such as a severe illness.

✓ Increased demand for land on the FSP hills

On all hills visited, farmers and landowners commented on an increase in demand for (quality) farmland. It is not possible to clearly differentiate between an overall increase in demand for farmland (because of population growth, the influx of displaced people from other parts of the country, and possibly the impacts of COVID and the recent food price increases on off-farm employment and livelihood opportunities) and the increase in demand for land on the FSP hills. However, there are indications that the demand for land on the hills has increased more than elsewhere, with, in some cases, tenants from neighboring hills asking for plots on the FSP hills. This is a good outcome for landowners, but not necessarily for the tenants, who can end up competing with newcomers (who may offer higher tenure fees). Managers on several hills said that they can easily find new tenants, and some tenants told us that they are worried that they will not be able to continue farming their plots in the future if increased demand for land drives up tenure fees beyond their reach. Currently, tenants are protected to some extent by the presence of the project, but it is not clear what may happen after FSP has ended, or whether the COCOVE will be strong enough to keep up the negotiations with landowners. However, the increasing demand for land on the improved hills can also act as an incentive for landowners to invest in the Hill Approach.

✓ Increased area under crop cultivation

On most hills, the area under cultivation appears to have increased because of the SWC interventions, which enabled the cultivation of parts of the hills that were previously barren. On H4, the SWC works resulted in reduced flooding of the valley bottom, which is now brought under permanent cultivation. However, the estimates of the proportions of land cultivated on the hills varied significantly between different groups interviewed. In the absence of a baseline, it is difficult to assess the extent to which the area has changed. In addition, several external factors influence the area under cultivation, such as (on H5) the opening of an artisanal gold mine nearby, which led many farmers to abandon their plots to work in the mine. On several hills, several rainstorms with hail damaged crops in early 2022, in some cases wiping out everything, leading to the abandonment of plots (H8). Management decisions by the landowners also influence the area under cultivation. For example, on H1, the landowner increased the area for grazing his cattle, thus reducing the part available for crop production. On H7, tenants said that there are still plots available on the hill suitable for cultivation because the tenancy fees are very high, and farmers cannot afford them.

Increased income from crop sales is used by farmers to pay school expenses.

✓ Increased number of tenants

The increase in demand for land on the hills after the implementation of the initial SWC interventions resulted overall in an increase in the number of tenants. However, in some cases, the number of tenants reduced because the landowner increased his use of the hill (H1), some tenants increased their farm size on the hill, or tenants left because of hail damage to their crop or other income generation opportunities (the gold mine near H5). When the field visits for this current report were done in May 2022, tenants on several hills said that farmers were already asking for plots for the cropping season starting in September 2022.

✓ Increased income (to the landowner) from tenure fees

If there are more plots under cultivation, it follows that the income from plot rental fees would increase, and this was confirmed by most landowners and tenants. Even where tenure fees per plot have reduced, the increase in both the total amount of fees collected (because of an increase in the number of plots cultivated/number of tenants) and the ability of tenants to pay the fees (because of an increase in productivity and hence income) has overall increased the amount and predictability of income to the landowner on the area of the hill where FSP operated. Unfortunately, the information obtained from landowners with regard to the original number of tenants before FSP differs significantly from APC figures and may not be accurate.

The amount of tenure fees per unit area varied widely between hills. In some cases, there was no agreed rate per unit area (standard plot size), and some of the contracts negotiated by the COCOVE and APC do not include a plot size (e.g., for H1).

✓ Increased availability of labor for *salongo* for landowner

An increased number of tenants, combined with an increased level of organization of tenants and improved communication between tenants and landowners, most likely resulted in an increase in the person-days of "free" labor (*salongo*) that tenant farmers provide for the landowner/manager of the land. This was generally confirmed during the interviews, and it may be possible to compile figures on this based on the evolution of tenants and the number of days of *salongo* required over time. COCOVE members, other tenants, and the landowners/managers commented that the landowner benefits also from the increased level of organization of tenants via the COCOVE, who often not only organize the *salongo* activities for SWC measures but also the *salongo* on the fields of the landowner/manager – something that would have previously been the role of the manager (who is paid in cash or kind by the landowner). The COCOVE thus provides a "free service" to the landowners on some hills, further increasing the benefits to the landowners.

On all hills, the number of *salongo* days per month has overall increased, because in addition to days worked on the fields of the landowner, tenants now also must work collectively to maintain the soil and water conservation measures. Most tenants interviewed had other fields outside the specific hill – either in another plantation or their own fields. Farmers and COCOVE members on several sites said that the amount of *salongo* required was excessive and COCOVE members struggle to mobilize farmers to attend the SWC *salongo* days. There are fewer sanctions available for the COCOVE than for the landowner, who could terminate a tenure contract if the conditions stipulated in the contract are not met. The COCOVE has no such sanctions at its disposal.

✓ Increased value of land

Tenants on all hills pointed out the increase in the value of the hill. On H3, tenants said that the landowners effectively received the free services of an agronomist, whilst also benefiting from the knowledge that tenant farmers have gained via the various trainings. Landowners and managers were more reluctant to mention this key benefit for them, which came at hardly any cost to them. However, it was not possible to quantify this benefit in monetary terms because the value of the plantations before the project started is not known, and neither is the current value.

✓ Increased income from trees and fodder on the hill for the landowner

On some hills, Napier from the contour hedges is sold for roofing, with the income going to the landowner. The agroforestry trees normally belong to the landowner, but tenants can use them for green manure on the hill plots and, in some cases, for livestock fodder. Other farmers can buy fodder from the hill from the landowner (in cash or in return for manure). There is also an indirect benefit to the wider community, who can purchase fodder, canes, and possibly in the future timber.

✓ Increased tenure fees for plots (In some cases)

On four of the nine hills visited for this study (H1, H7, H8, and H9), tenants told us that the fees increased, mostly because of an increase in the productivity of the land, and in the case of H8 because *salongo* for the landowner was replaced by a cash payment (the manager now hires labor to work on the owner's land, using the income from the increased fees). Whilst from the tenants' perspective an increase in fees is always undesirable, some tenants commented that the fees are still affordable, considering the production that they can get on their plots.

✓ Reduced tenure fees for plots (In some cases)

Some COCOVEs were able to negotiate a reduction of tenure fees on behalf of their tenants (H4, H5, and H6), convincing the landowner that this would be to his advantage, as it would ensure higher demand for plots on his land, overall increasing his benefits. This is a benefit for tenants, but the landowner also benefits by getting a good reputation with existing and prospective tenants (H4).

✓ Reduced amount of *salongo* per tenant on the landowner's plot (In some cases)

Similarly, on H6 the COCOVE was able to negotiate a reduction in *salongo* for the landowner, arguing that there are now more tenants on the hill, so overall there are more person days of *salongo* for the landowner.

✓ Reduced crop theft

On most hills, crop theft has reduced, with tenants and landowners attributing this to the level of organization of people on the hills (via the FFS and the COCOVE). The presence of MC and its partners also contributes to this, with some people fearing sanctions.

✓ Reduced livestock damage to crops

Whilst livestock straying onto fields and causing damage still happens occasionally, the extent of it has reduced on most hills (according to FGDs with tenants) due to sensitization by FSP staff and the COCOVE and enforcement of sanctions (sometimes with help of the village head). On a few hills, however, livestock damage persists or has even increased (in particular H1) due to the hill having lush vegetation as compared to neighboring areas, acting as a magnet for livestock owners and their animals. In some cases (H4), the COCOVE was able to convince landowners, including on nearby hills, to reserve some land for livestock, thus decreasing the pressure on the cultivated land. The success of this component relies to a large extent on the authority and motivation of local leaders (village heads), i.e., their willingness and ability to enforce sanctions. On H8, we found goats grazing in the part of the hill used by the landowner for coffee and trees (grazing is prohibited in these areas).

Grazing restrictions on the FSP hills will have affected those livestock owners who used the hills for grazing but are not tenants on them – they now must either search for other pastures or buy fodder from the hill owner. It is not known how many people were affected by this on the different hills. Tenants on the hills are normally allowed to cut fodder from the hedges and trees for their livestock for free.

✓ Increased fodder availability

On all hills, farmers and landowners noted a significant increase in fodder availability because of the planting of fodder grasses (Napier grass) and multipurpose trees and hedges. It is fair to assume that there has also been an increase in crop residues (some of which might be used as livestock feed) because crop production has increased. On some hills, livestock owners who do not have plots on the hill can harvest fodder from the hedges and pay the landowner in manure.

✓ Crop diversification

Soil erosion was mentioned by nearly all tenants as the main reason why the main (and often only) crop grown on the hills was cassava. Farmers tried to grow maize and beans before the FSP interventions, but seeds and even established plants would be washed away during heavy rains. Other crops (including yam, taro, sweet potato sunflower, soybeans, and groundnuts) were already grown on the hills, but only in pockets with lower levels of erosion. Most farmers said that it is the proportion of different crops that has changed (so less cassava now and more other crops), rather than the diversity.

Farmers received an improved variety of cassava (*sawa sawa*) from National Institute for Agronomic Studies and Research (INERA) (via FSP) that is partially resistant to CMD, but have since obtained cuttings from the variety V8, which is even more resistant. The cuttings for V8 were purchased – perhaps an indication of farmers' increasing willingness to invest in their farming operation.

All crops grown by tenants on the hills are used both for food and cash, and the proportion sold depends on the production volume in a particular season. Priority is always given to feeding the household first before selling. Only those hill farmers who participated in FSPs permagarden component benefited from access to vegetable seed and advice on vegetable production.

On all hills visited, tenant farmers are not allowed by the landowners to cultivate perennial crops (e.g., coffee), which is in line with the annual tenancy agreements in place on most hills. Growing perennial crops could cause conflicts as it would make it more difficult for landowners to take back land from tenants. Tenants are sometimes also banned from growing cash crops such as sugar cane. The written contracts usually stipulate what types of crops can be grown on a specific plot, and the landowner or manager needs to be asked for permission if this was to be changed.

✓ Improved diets of tenants and their families

There was very limited evidence that the Hill Approach on its own contributed to improved diets. H2 and H7 tenants said that the increase in production enabled them to have more frequent and diverse meals (not only cassava), but it was not possible to ascertain what proportion of households had experienced this benefit or to what extent any changes in diets can be attributed to FSP.

Cutting grass for cattle feed on Bushanganywa hill

Groundnuts can now be cultivated on the hills.

✓ Increased quantity and range of agricultural produce available in the local market

This was mentioned by tenants and landowners a few times, because of an increase in productivity, as well as an increased proportion of area cultivated with crops such as beans and maize that previously did not perform well on most of the hills.

3.1.4 HUMAN, SOCIAL AND INSTITUTIONAL CHANGES: BUILDING INSTITUTIONS AND CAPACITIES

FSP has clearly contributed to building the capacity of individuals and institutions. This was done primarily via training sessions targeting FFS and COCOVE members.

The FFS played an important role in mobilizing and organizing farmers; they form the backbone of the COCOVEs (and tenant representatives are elected from among FFS representations). FFS members were trained in improved agricultural practices and SWC practices, as well as post-harvest operations and marketing and livestock keeping. All tenants interviewed appreciated these trainings and the knowledge gained. The last training (a refresher on SWC) happened in March 2022, with training activities phasing out as part of the FSP closure period.

FFS members were given cassava cuttings, bean seeds, and some other seeds, but many of them complained that the cuttings had dried up by the time they were distributed and that the bean seed did not germinate. The planting material was distributed by FSP partner HarvestPlus.

During years 3, 4, and 5, FFS members usually had a demonstration plot where new practices were shown, and trainings held. These fields were managed collectively, and the produce was shared between members. Since project activities focusing on FFS ceased, and on most hills, there is now only one field for all FFS which is managed collectively via the COCOVE (H3, H7). Tenants all contribute to the rent of these fields and share the benefits, but on H7 the COCOVE members said there was a reluctance from members to contribute to the rent of the field.

FFS members have shared knowledge and experience on SWC and sustainable farming practices with community members in their localities, but this seems to have been more on an ad hoc basis, depending on the initiative and interest of individual members, rather than an explicit organized activity. It appears as though the FFS were a way of organizing farmers for trainings and demonstrations, rather than a process of farmer-led experimentation to test farmers' proposed solutions.

The maintenance work on the hill (de-silting of water channels and ditches, repair of bunds where necessary, etc.) has been organized on most hills by FFS, e.g., the members of each FFS desilting/clearing one contour line. The tools that were given to tenants for the SWC works were distributed via the FFSs.

FSP envisaged that FFS and COCOVE members would join existing VSLAs run by project partners (World Vision in Kalehe, Mercy Corps in Kabare). However, this turned out to be not practical because the FFS and COCOVE had developed their own social capital and were interested in forming their own groups. In any case, VSLA may not be the appropriate mechanism to ensure the sustainability of the COCOVE, because COCOVE membership can change at each election every three years. COCOVE members could undertake business activities together to generate income if they chose so - some of them are already doing that.

✓ Increased knowledge of SWC practices

Tenants and landowners on all hills pointed out their increased knowledge and understanding of these practices, including the measuring out of contour lines using the A frame, digging the canals and trenches, and maintaining them regularly. Several tenants pointed out that the skills and knowledge they gained are transferrable and they are confident they can apply it to other contexts (e.g., other hills) if they chose to leave and go somewhere else. In Mpinga 1, the agricultural school benefits from the presence of FSP because they can take students to the hill for work experience (learning about SWC and agroforestry).

✓ Increased knowledge about the establishment and use of agroforestry trees and fodder grasses

Farmers learned about the use of life hedges using commonly available shrubs such as *Tithonia diversifolia* that can be used as green manure, and agroforestry trees that improve soil via nitrogen fixation and leaf litter. Some farmers believed before that (all) trees will reduce crop yields because they compete with crops for nutrients and moisture.

✓ Increased knowledge of good farming practices

This was achieved mostly via the FFSs, who trained farmers in a range of agricultural practices. These included the use of green manure, compost making and application, use of crop residues and weeds as mulch, incorporation of residues instead of burning them, the importance of following the agricultural calendar (timely land preparation, sowing/planting, and weeding), the use of improved crop varieties, integrated pest management (IPM), and the production and use of biopesticides.

✓ Increased knowledge about farming as a business, crop processing, and marketing

Tenants commented that they learned about planning their production and retaining a part for sale, how to store produce and wait for a better price, and how to negotiate with traders.

✓ Increased ability to negotiate, mediate and address conflicts

Members of all the COCOVE interviewed and some of the tenant farmers emphasized their ability to mediate between different individuals/groups, solve conflicts and negotiate on behalf of the tenant farmers with the landowners. Negotiations on behalf of the tenants included reducing the amount of *salongo* that each tenant must do on the landowner's fields, reducing the tenancy fees, initiating, and achieving written contracts for tenants (six of the nine hills visited), solving disputes between tenants (previously, these were referred to the police, who would charge a "fee"). Tenants on several hills (H3, H4, and H5) said that the landowner benefits ultimately from the presence of the COCOVE and of well-trained and motivated farmers, even if it means he/she must compromise at times.

Members of the COCOVE of Ihuzi hill

✓ Increased awareness of the role of women in agriculture and women leadership

This was mentioned by a few female COCOVE members (all COCOVE include an equal number of female and male tenants), but not by tenants. It included women's realization that they make a valuable contribution to agriculture. FSP training sessions included gender awareness and the role of women and men in the household and the community. However, during discussions with COCOVE members, women were less vocal and contributed fewer ideas than their male counterparts, likely reflecting cultural norms. We were not able to establish whether the labor for the establishment and maintenance of SWC measures on the hill came primarily from women or from men.

✓ Increased social capital between farmers and between farmers and landowners/managers

The relationship between tenants and landowners (or rather, managers) appears to have improved on all hills because of the COCOVE formation and its negotiation and mediation role. Tenants also talked about increased unity and collaboration between tenants on the hill because of the FFS and COCOVE, enabling some of them to evolve into VSLAs (H7, H8, and H9 under World Vision). However, cases of envy/jealousy were also mentioned, with some tenants believing that COCOVE members have received excessive benefits from the project (in particular in terms of transport cost reimbursement for travel to training and events). FSP is trying to address this by further sensitization of tenants on the role of the COCOVE.

✓ Changes in attitudes, confidence, and other intangible attributes

Tenants said that they have gained confidence and have realized that they can actually produce something on the hills, with the right type of interventions. The process and experience have given them the courage to try out new things and not to give up easily.

3.1.5 CHANGES IN TENURE ARRANGEMENTS

A key objective of the Hill Approach was the negotiation of longer-term tenure contracts and a reduction of tenure fees, as well as a formalization of contracts (replacement of verbal agreements with written ones).

On five of nine hills, there are now written tenure agreements for at least some of the farmers under FSP. On the other four hills, agreements are still informal/verbal only. The written contracts vary significantly in scope and conditions, and in the amount of detail provided. For example, on H1, the contract only stipulates the duration of the contract, but neither the payment nor the plot size. The aim has been to include several key dimensions in each contract: The duration of the tenure period, the plot size, the amount and modality of payment (cash, labor, or both), and any restrictions with regard to crops grown. But arrangements on each hill need to be adapted to the local context and are subject to approval by the land owner, which explains the variation in contracts.

In terms of duration, only contracts on H1 were for three years. On all other hills, we were told that contracts were annual (we saw examples of those for H5 and H8), not a minimum of three years as stipulated in the PV (Annex 9). FSP partner APC has been trying to develop the capacity of COCOVE to negotiate longer contracts, but this has proven more difficult than initially expected.

On hills where only a certain proportion of land (and tenants) was included in FSP, the terms and conditions negotiated by the COCOVE appear to apply only to tenants under FSP, and not to others on the hill. This results basically in a "two-class society" of tenants, and potentially in conflicts and jealousies between tenants. This might even be an indication that the landowners/managers on these hills have not really internalized the FSP-supported interventions related to tenure contracts, to the extent that they would apply them to their whole hill (and, potentially in the future, to other hills).

On five out of nine hills visited, the tenure fees have increased rather than decreased.[10] According to farmers and landowners interviewed, this has mostly been because of increases in productivity on the hill and the increased demand for land on the hill. Landowners or their managers have thus effectively violated the original MoU developed with FSP (Annex 6), which had included the agreement (albeit not very specific) to keep the tenure fees "accessible." In discussions with FSP partner APC, who is leading the tenure security component of the Hill Approach, it became clear that it has been very difficult to convince landowners to honor the agreement made. The MoU has no legal validity, and landowners have the right to determine tenure fees for their land.

Similarly, landowners want to retain the flexibility to sell land at any time and may not want to engage in longer-term contracts with tenants as it might reduce their options for selling the land. Even where landowners are willing to issue contracts for several years, they want to be paid in advance, but tenants are not normally able to pay fees for more than one season or year at a time.

Hence the main achievement of FSP with regards to tenure contracts has been their formalization, and the development of capacity in the COCOVE to negotiate with landowners on behalf of the tenants. Whether this capacity is sufficient to prevent a further increase in tenure fees in the future and ensure that those tenants who participated in the SWC measurements on the hills can stay there, remains to be seen.

10 However, the information collected about tenure fees during the short hill visits is not fully conclusive. Different tenants mentioning different figures, and the reference plot size may have changed since the start of FSP.

BOX 3: INCREASING TENURE SECURITY – AMBITIONS AND PROCESS

Increasing tenure security has been a key objective of FSP from the start, as a pre-requisite to encourage farmers to invest their labor in SWC and other labor-intensive farming practices that yield benefits in the medium to longer-term (such as the production and use of compost, and mulching).

Before FSP, tenant farmers' access to land on the hills depended to a large extent on their personal relationship with the landowner or manager. Because of the absence of any written agreements, there was often a high level of uncertainty about the terms and conditions of access to land. According to FSP partner APC, landless farmers were often the victims of a violation of their rights through evictions and unilateral (by the landowner or manager) revisions of the conditions for land access (e.g., increase in tenure fees and the number of *salongo* days). Tenure fees often varied between farmers, depending on their individual status and ability to negotiate.

APC has worked with communities and socio-political actors in South Kivu to adopt peaceful means to address conflicts, including conflicts related to land. Their approach in FSP has been to establish and strengthen community-based organizations that have the capacity to negotiate with landowners. **By working collectively, farmers have been able to engage the landowners in dialogue, something that had not been possible for individual farmers.**

The results of these negotiations include a formalization of the terms and conditions of tenure, in most cases now in a written form. This is a major achievement, as it provides for the first time a level of clarity and security to tenant farmers. Beyond that, the details of the contracts vary from hill to hill, as is to be expected considering the differences between landowners and their holdings. Influencing factors include:

- the size and number of hills/plantations owned by a landowner,
- the domicile of the landowner (and how distant it is from the hill),
- whether the landowner knows the tenant farmers personally from having lived and worked with them in the past (with some older landowners passing on the management responsibility of their hills to their sons, who may have grown up in the city),
- the extent to which the owner seeks to "do justice" to the tenant and wants to contribute to sustainable local development (rather than maximize his/her own short-term profit).

Therefore, the results of the negotiation process between tenants and landowners vary from hill to hill and are still undergoing changes when this current report was written. APC will continue working with the COCOVEs on all hills throughout 2022/23 to further improve the tenure contracts, with the aim of achieving the best possible outcome for tenants on each hill.

There clearly needs to be a certain level of flexibility with regard to the details in each contract, and landowners need to feel that they are not being pulled over the table into an arrangement that is not advantageous for them. These issues were discussed with the FSP team during the debriefing, and it was agreed that the team would invest over the next 15 months in a process of reviewing (and, where necessary, improving) the tenure contracts and strengthening the capacities of COCOVE to negotiate. Demonstrating to landowners the significant benefits they are gaining from the Hill Approach (even without increasing tenure fees) could also contribute to fees remaining at the current level.

3.1.6 DISTRIBUTION OF BENEFITS

Whilst there appear to have been significant benefits to landowners and tenants, it is difficult to ascertain to what extent these changes have benefited the wider community. In all 9 sites/hills, tenants said that they shared knowledge with their neighbors and the wider community, etc., but it was not possible to check whether this transfer of knowledge has been effective.

Table 3 gives an approximate indication of the extent that these changes have affected different groups (tenants on the hill, the landowner, COCOVE members, farmers in the valley bottom, farmers on other hills, livestock keepers, and the wider community). When asked about the distribution of benefits between different types of farmers on the hill, different views were expressed. Some believed that there is a clear difference between plots on different parts of the hills, e.g., those on steeper sections having overall benefited more (seen more improvements) than those on sections that are less steep. Others said that these differences are small and that it is farmers' investments in soil amendments (manure, compost) that make the biggest difference to crop production. Different parts of the hill are also affected differently by hail, crop theft, and livestock damage.

Farmers from outside the hill benefited directly or indirectly from the increased biomass production on the hill (availability of fodder, thatch, etc.) and knowledge/experience shared by their neighbors. In some cases, hill tenants said that people from nearby areas, who have no land or degraded land, come to them for (free) cassava leaves as vegetables.

When considering the distribution of benefits, it appears that the landowner is the main winner, because he/she has many economic benefits without any or much investment. The COCOVE manages/organizes not just the *salongo* for the maintenance of the SWC, but in some cases also on the plots of the landowner, who thus benefits from a "free" manager of the land. It is also not clear how tenants who participated in the original SWC works (which was the "heavier" part, whilst now only maintenance is required) feel about new tenants coming to the hill and benefiting from the project interventions, without having contributed to the initial works.

It appears that, already near the start of the Hill Approach, it was envisaged that landowners would receive significant benefits for free. A key project document (FSP 2019) says (translated):

> ***It is our responsibility to convince them [concessionaires] of the benefits of the approach for them: more land that can be cultivated in the long term and can therefore be rented out; trees that can be exploited; if they have animals, fodder is available thanks to the trees; in areas where there is currently no production, the land is developed free of charge and sharecroppers can be put in place free of charge for a defined period.***

In hindsight, perhaps the project provided too many benefits for the landowners without much engagement from their side. But if more had been asked of them, perhaps it would have been harder to identify landowners willing to allow the project to use their hill as a pilot.

3.1.7 FARMERS' EXPECTATIONS OF FUTURE BENEFITS

When prompted, tenure farmers said during FGDs that they expected benefits from the SWC activities to increase in the future, as the soil improves further, and trees grow to full maturity (in particular fruit trees). In H3, farmers hoped that the trees will also eventually act as windbreaks when fully grown. Tenants estimated that the optimum situation would be achieved in between two and 10 years, with the average at about 5-6 years, provided farmers keep up the maintenance activities and continue with organic soil amendments.

All groups (female and male tenants) on all hills said that the results they achieved with the Hill Approach have been worth the effort and the investments made so far. This is a strong indication that (a) benefits have been experienced by a broad range of tenants, and (b) these benefits, by farmers' own measures, have exceeded the costs/investments made. Some tenants commented that they used to invest effort in farming on the hill before (land preparation, planting, weeding…) and would not get anything in return (because of the high degree of soil erosion). Now, after the implementation of the Hill Approach, they still invest a lot of effort, but they are getting something in return. In H6, an elderly man said:

> ***Even our children and grandchildren will benefit from this.***

– so there seems to be an awareness that benefits are long-term.

However, this does not mean that the approach necessarily has a positive cost-benefit ratio and is economically viable. Whilst farmers were not directly paid for the work on the land, they received a number of incentives (tools, trainings, meals during the working days, transport reimbursement). Although the benefits could potentially be quantified (e.g., in terms of increases in area under production, yield, sales, and income for tenants; and increases in fees and labor for the landowner), it would be difficult to quantify the costs of the approach both for farmers and the project. There has been no monitoring of labor inputs from farmers (and assessment of the opportunity cost of labor), nor a quantification of the other expenses (tools, training costs, etc.). It is therefore not possible to ascertain whether the approach constitutes value for money. However, the approach was implemented on a pilot basis by FSP, and if it was replicated by other actors on other costs, it is fair to expect that costs per hill would be lower than during the pilot because the learning from the pilot would result in increased efficiency of interventions.

3.2 The process of designing and implementing the Hill Approach

3.2.1 LANDOWNER AND FARMER PARTICIPATION IN HILL DESIGN

As shown in section 2.4, landowners and tenant farmers were not directly involved in the development of treatment plans for the hills. Rather, their agreement was sought only after the initial design had been done by UEA and partners. This was confirmed by the discussions with landowners and tenants on the hills visited. On several of the hills (four out of nine), either the landowner/manager or tenants mentioned that the landowner/manager had not been sufficiently involved from the start (H1, H3, H5, and H6) and did not participate in the development of the treatment plan.

On H5 and H7, farmers and landowners specifically mentioned that they had not received feedback from UEA about the outcome of the soil sampling. The language used to explain the soil sampling process was apparently not always adapted to farmers' interests and knowledge (H1).

Tenants confirmed that they were consulted, and, when pressed, gave some examples of suggestions they had made and that were taken on board:

- Planting of trees on plots, not just on the contour lines (H8)
- Farmers' refusal to plant Napier, as it was considered too vigorous, competing with crops (H4)

Farmers' and landowners' expectations with regards to being involved in the design were very low, however – they considered the treatment plans to have been done by experts, who knew about these technologies (which were new to the tenant farmers), and they had reasonable confidence in their knowledge. Several farmers commented that they would not have been able to do a treatment plan, because they did not know the technologies. There does not seem to have been any explicit encouragement of experimentation (trying out different options, monitoring their effect, and adapting) and the focus of the field monitoring appears to have been mostly on checking that things have been done as per the experts' advice.

3.2.2 LOCAL AUTHORITY PARTICIPATION

Nominally, the *chefs de village* (village heads) are members of the COCOVE and are meant to participate in all COCOVE activities. In practice, it appears as though the extent to which they are actively engaged varies between hills.

The main role that the village heads see for themselves is the enforcement of by-laws that are supporting the hills as well as other agricultural lands, in particular:

- Control of bush fires
- Control of livestock that is straying onto fields causing crop damage and/or damaging the SWC works
- Control of crop theft

In some cases, the enforcement of these restrictions is done by the COCOVE, but on most hills, tenants still rely on the authority of the "*chefferie*" to enforce restrictions and raise awareness in the community about by-laws.

3.2.3 COLLABORATION BETWEEN FSP PARTNER ORGANIZATIONS

Different FSP partners had different roles with regard to the Hill Approach, providing complementary skills and expertise relevant to the task at hand. There were frequent meetings and workshops to coordinate activities, share lessons, and adapt the strategy. It is difficult to ascertain how effective this process has been, but the documentation suggests that a genuine effort was made to include reflection and learning in the implementation process.

For the tenants and landowners interviewed, it may not always have been clear who oversaw what or how roles and responsibilities are distributed between project partners. Therefore, local stakeholders did not always know who to contact with regard to specific activities or issues, but this was less of an issue as the project progressed. There may at times have been a bit of a disconnect between UEA (in charge of the development of the treatment plans for each hill and some monitoring of soil quality), Mercy Corps and World vision (in charge of the implementation of these plans and provision of training and backstopping), and APC (in charge of social mobilization and COCOVE training), but strong efforts were made by FSP to share information, review progress and communicate effectively throughout between partners.

3.2.4 HILL SELECTION CRITERIA

The criteria for selection of hills (see also section 2.4) were as follows:

- Risk of a high level of erosion or susceptible to erosion, and are therefore posing a risk to the lands in the valleys (*bas-fonds*)
- Plots are not currently cultivated, but could be rehabilitated
- The hill belongs to a single owner, who either lives in the area or where the manager has decision-making power.

These criteria were chosen for the pilot to ensure that the selected hills would, on the one hand, enable some significant improvements in productivity, following treatment, but, on the other hand, not be so degraded that SWC measures would not be sufficient to bring the land back under cultivation. Selecting only hills that are owned by one individual was meant to make it easier to negotiate with the landowner, initially to have his/her agreement to undertake the activities, but also, in the longer term, to negotiate land access to tenant farmers with favorable conditions for the tenants.

The criteria did indeed result in hills chosen for the pilot where significant progress could be made during the 3-4 years of actual interventions. However, the terms and conditions of engagement for the landowner were very favorable for him/her, with no clear responsibilities on their side except allowing FSP to carry out the work. The MoU developed with landowners (countersigned by village heads, see Annex 9) included the following conditions:

- Make the hill available for FSP to implement the Hill Approach for a minimum of five years.
- Accept that several different technical and research studies are carried out on the hill and that different SWC and crop production techniques will be promoted and implemented to increase soil fertility and crop yields.

- Accept the technical design proposed by UEA.
- Accept to proceed to longer-term tenure contracts of at least three years with the COCOVE and the individuals hiring land, and propose a more accessible (lower) tenure rate for FSP participants.
- Accept the formation of a COCOVE on the hill and sign a collaboration agreement with the committee.
- Respect and honor the engagement signed with the COCOVE.

But on three of the nine hills visited, tenure fees had actually increased rather than decreased, and tenure contracts on eight of the nine hills are still only annual contracts, with no guarantee for the tenant that the contract will be renewed (see contract example in Annex 10, and a further discussion of these issues in sections 3.1.5 and 4.2.3).

This begs the question of whether the selection criteria for hills should not have included a "stronger" commitment from the landowner, including perhaps a contribution to the SWC works (e.g., in the form of free tenure for participating farmers for a limited duration, followed by an agreed tenure fee that should not exceed a certain level). At the time when the hills were selected, it might have been difficult to find any landowner willing to commit to investing his own resources (or forego income), as the results were uncertain. However, as the "proof of concept" has now been made, and the changes that the Hill Approach can bring about have been documented, landowners' willingness to contribute to the rehabilitation of, what is de facto, private property, seems completely reasonable.

3.2.5 PARTICIPANTS' EXPECTATIONS FOR FURTHER SUPPORT

As a result of the protracted presence of and dependence on humanitarian agencies in South Kivu, farmers and even landowners/land managers expressed their expectations that FSP would provide further and additional support to them in the future in order to address a range of challenges. These included the following:

- Support for livestock production was mentioned on almost all hills, referring not just to training, but to the donation of animals. Some farmers were aware that FFS P2 (Mother and Child Health and Nutrition) donated rabbits to some households (meeting certain criteria, i.e., having young children) as part of the program, and they would have wanted this component to be available for all hill farmers in order to support the production of manure for their compost.
- Support in draining the water from the valley bottom in H1 (Cinjoma), as the flooding of this valley (not the result of the Hill Approach) has reduced the area under cultivation.
- Provide seed to farmers to compensate for seed lost during the recent hailstorms, which led to complete crop loss in some areas (e.g., H2)
- Further support for fodder production H2)
- Further training in the production and use of biopesticides (H3, H6) and compost making (H6) (possibly because new tenant farmers arrived on the hill who did not participate in the original training, which was held on all hills).
- Provision of additional tools and materials, including watering cans and sprayers (H3), to expand the SWC works to other parts and help with the maintenance of the existing structures (H4).
- Setting up a tree nursery at H4 (agricultural school) – they do have trained technicians, but no resources to set up the nursery. Similarly, on H6 farmers asked for more tree seedlings – they assume that FSP had not considered the size of the hill when providing seedlings for them.
- Training in agribusiness (H6).
- Extend the duration of the project by another few years (H5).
- H9 asked for a cassava mill, as the existing commercial mills in the area charge high rates for milling.

Other than FSP, there do not seem to have been any recent activities supporting agriculture and natural resource management on the existing hills.

3.3 Sustainability and replicability of the approach

3.3.1 SUSTAINABILITY OF ACHIEVEMENTS ON THE 18 PILOT HILLS

There are principally two dimensions to this: (a) the sustainability of the soil and water conservation measures and (b) the sustainability of the institutional and social arrangements on the hill. Both are interconnected, as the maintenance of the SWC measures depends on voluntary labor provided by farmers.

The sustainability of the SWC measures, which includes the maintenance of the contour lines, desilting of trenches and check dams, and pruning of agroforestry trees and grasses, is carried out via collective labor provided by the tenant farmers. Even before FSP, tenants would carry out work (in Lingala "*salongo*", see Box 2) collectively (or, occasionally, individually) on the land of the hill owner as a part of their payment for land use. It was agreed with the landowners that some of this labor could be used for the maintenance of the SWC measures, but in practice, on most of the hills visited, farmers now do both *salongo* for the landowner (at the same frequency as before FSP) and, in addition, SWC maintenance work.

Mobilizing farmers for SWC work seems to be difficult on some hills. The contract with the landowner usually stipulates the *salongo* obligations for the landowner (and non-attendance carries the risk of eviction), but not the maintenance works. COCOVE members on several hills said that they are struggling to mobilize farmers, with often only a small proportion of farmers showing up on the agreed workdays. This is particularly challenging during the rainy season, with canals filling up with silt rapidly and the work invested possibly not always keeping up with the requirements.

On the other hand, tenant farmers complained that the frequent *salongo* does not give them sufficient time to cultivate their own fields. Most farmers have other land outside the FSP hills, and some farmers in Kalehe even had land on two FSP hills. This means that they or members of their families must work several days per week on either the owners' plots or doing SWC maintenance. There has not been any assessment of the workload required for this in relation to the benefits (in terms of increased productivity), and there is a danger that maintenance activities will lapse after the end of the project.

With regard to institutional sustainability, some tenants on H8 explicitly expressed their concern that things could fall apart once FSP leaves. Similarly, on H9, tenants were not confident that the COCOVE would be able to mobilize people once the project has ended. There are concerns that the COCOVE will cease functioning after the end of the project, in particular if the intended renewal of mandates envisaged for the end of the 2022 resulted in a large turnover of COCOVE members. COCOVE members were elected for three years in 2019, and elections are meant to be held in late 2022.

Whilst, overall, both tenants and landowners on the nine hills visited were positive about the achievements and performance of the COCOVE, some concerns were raised that COCOVE members were not sufficiently active. When elections result in a new COCOVE membership, at a time when most training activities of FSP have ended, it is not clear how these new members will acquire the skills and experience to take the difficult role of not just mobilizing farmers for collective work, but also negotiating with the landowners on behalf of tenants for better tenure conditions. This issue was discussed with the FSP team and recommendations were made to develop a clear exit strategy for COCOVEs.

Related to this is the challenge that tenure contracts have not improved significantly on all hills, with the majority of contracts being annual (without any commitment from the landowner to renew the contract automatically), and tenure fees have been increasing on some of the hills visited. Hence it will require some efforts on behalf of the FSP team to ensure that the gains made will be sustained and that the institutions developed are firmly grounded and supported by local authorities (village chiefs).

3.3.2 REPLICATION OF THE HILL APPROACH ON OTHER LAND FARMED BY THE TENANTS OR OWNED BY THE SAME LANDOWNER

Nominally, there was interest in expanding activities to other parts of tenants' land. However, in practice we did not see any of this happening and even the sections of the hills that were not under FSP had not been treated.

Farmers said that the measures that can easily be adopted by individuals (without collective action) and that do not require additional resources (e.g., access to agroforestry species) have been adopted by some of them – but it was not possible to estimate what proportion of farmers. This includes compost making and application, increased spacing of plants, crop rotation, intercropping, etc. However, activities that require collective action (contour lines, agreement on bylaws for livestock and bush fire control) or external resources (seeds or cuttings) seem to have spread much more slowly or not at all (see Figure 7 below).

FIGURE 7: DEGREES OF DIFFICULTY IN REPLICATING HILL APPROACH COMPONENTS

The feedback received from farmers was mixed, with farmers on H4 saying that implementing the SWC measures on their own land would require support from FSP, whilst on other hills, individual farmers said that they had adopted some measures on their land, in particular planting of agroforestry trees, use of compost, mulching, and other cultural practices.

The landowner of H5, who has two other hills, said he already planted agroforestry trees on these and even started the contour ridges (stabilized with hedging plants).

On almost all hills, COCOVE members and (some) tenant farmers were interested in becoming private service providers who would train and support landowners and tenants on other hills to implement the Hill Approach. They said that it would still require tools being provided to farmers via a project because not all farmers have tools suitable for digging trenches. COCOVE members were also interested in exchanging experiences with COCOVE from other hills (there were some exchange visits organized earlier by FSP, but only between nearby hills, and farmers from the Kalehe hill are interested to visit those in Katana).

3.3.3 SCALING OUT OF THE HILL APPROACH IN THE WIDER REGION

Most tenants on the hills visited said that they share knowledge with neighbors/community – but it is difficult to assess whether this knowledge is put into practice. There are no indicators that there has been significant adoption on non-FSP parts of pilot hills, or on neighboring hills. Farmers argued that it could be done, provided both tools and training were provided. However, landowners themselves did not appear to be very eager to expand the SWC measures, not even to other parts of the same hill where FSP worked, citing a lack of capacity to mobilize labor as the main reason.

We spoke mostly with land managers, who are usually local farmers with a higher level of formal education, and who are often related (albeit remotely) to the landowners. Especially where landowners reside outside South Kivu, it is possible that land managers do not have a sufficiently good understanding of the resources that landowners have at their disposal (most of them are wealthy individuals), and therefore cannot speak on their behalf with regards to financial capacities.

It appears the only way to address this bottleneck is to speak to landowners directly, sharing the experiences of the 18 pilots with them and pointing out the significant benefits (both economic and socially) associated with the Hill Approach.

Cassava grown by tenant farmers on Mpinga 1 hill.

4. MAIN LESSONS AND CONCLUSIONS

4.1 Strengths of the Hill Approach

4.1.1 RATIONALE AND PROCESS

The Hill Approach has, perhaps for the first time in the history of land rehabilitation measures in South Kivu, attempted to **address the interconnected challenges** of land degradation, low productivity, and tenure insecurity. It has done so by implementing simultaneously soil and water conservation measures, training farmers in improved farming methods, and developing the capacity of tenant farmer representatives to negotiate with landowners. This is an innovative and holistic approach that tackles some of the underlying causes of food insecurity in the region.

To do this, FSP has (generally) **successfully involved partners** with complementary skills and experiences, making good use of the capacity already available in the region. By working with the School of Agricultural Sciences and the Environment of UEA, the project was able to draw on experienced soil scientists, agronomists, GIS experts, etc., and their learning from previous soil and water conservation initiatives in South Kivu. APC contributed experience in citizen empowerment and conflict resolution – essential components when seeking to address conflicts around the land.

The recently undertaken **QIVC exercise** may be useful to track some key performance dimensions of the Hill Approach, especially if it could be extended to involve more than just two informants for each hill.

4.1.2 OUTCOMES AND IMPACTS

All tenants and land managers/landowners interviewed expressed their appreciation of the Hill Approach and found it very easy to list the **positive changes** that it has brought about. These include a range of environmental, economic, social, and capacity benefits. Whilst there may be a confirmation bias at play, with those interviewed expecting further interventions from FSP and therefore wanting to create a positive impression of the work done so far, it appears as though tenure farmers and landowners genuinely benefited from the approach.

Whilst FSP considers the 18 hills as pilots to "test" whether the approach could work, the changes observed on these hills are remarkable. The **soil and water conservation measures implemented have clearly stabilized the hills and contributed to improved soil quality**. This in turn has enabled farmers to diversify crops (where previously only cassava would have grown) and obtain higher yields. Most likely there has been an expansion in the proportion of land on the hill that is now under cultivation, but there is no conclusive evidence for this.

Some farmers said that the **increased yield** from the hill plots has enabled them to sell a surplus and use the **income** for essential expenses (school and medical fees) and for the purchase of livestock. The increased production may also have contributed to **improved food and nutrition security**, but the evidence for this is purely anecdotal.

Especially remarkable are the **capacities of tenant farmers** that have been strengthened – both in technical terms (soil and water conservation, improved agricultural practices, post-harvest operations, and marketing) and social terms (collaboration/collective action, negotiation, democratic governance, mediation, conflict resolution, leadership, role of women in agriculture). These skills are an asset that the project created, and that should be used to replicate the approach elsewhere.

FSP also enhanced **social capital** on the hills by establishing, training, and supporting community-based organizations (FFS, COCOVE). Whilst these are pre-requisite for the organization and implementation of the soil and water conservation measures, they have contributed to reducing conflict and increasing collaboration on the hills.

There has been some level of **formalization of tenure arrangements**, with tenants on six of the nine hills visited having now received written tenure contracts. Tenants overall appreciated its formalization. On two of the nine hills, the tenure fees have been reduced by the landowner, following discussions with the COCOVE.

4.1.3 SUSTAINABILITY AND REPLICABILITY

Some tenant farmers on the hills visited said that they **adopted some of the farming practices** (crop rotation, use of compost) that they learned in FFS on their other plots, and in some cases even SWC measures (e.g., one farmer on H9 said she dug a contour trench around her plot to reduce erosion). However, it was not possible to assess the extent to which this occurs, what types of adaptation to the technologies farmers have developed, and what factors determine adaptation and adoption.

Last, but not least, there is potential for the **replication of the Hill Approach via a "low-cost model,"** relying on COCOVE members and tenant farmers that have already been trained. This could significantly increase the number of hills that could be covered and increase the sustainability of the approach.

4.2 Weaknesses of the Hill Approach

4.2.1 TRACKING CHANGES

The Hill Approach was designed and started after the baseline data for FSP was collected. Therefore, baseline data on key impact indicators such as income, food security, and production was not collected for the hills – this would have required an additional survey. Hence, even though FSP considers the work done on the 18 hills to be a pilot/proof of concept, the **monitoring activities were not designed for such a pilot**. In particular, project partners did not agree on a wider set of relevant performance indicators that would be tracked systematically throughout the implementation phase, largely due to budget restrictions. The two indicators tracked are (1) the number of community actors trained to advocate and negotiate for land access on behalf of tenant farmers, and (2) the number of individuals obtaining a document entitling them to land access (ownership or sharecropping). There were no agreed outcome indicators to measure the agricultural gains emanating from the hills, which would have required a separate survey with cost implications.

Soil quality was monitored via a series of three soil sampling rounds on the hills by UEA. Otherwise, n**o baseline data was collected on key parameters** (such as crop yields and area under cultivation). A number of variables were tracked by different partners, using different tools and resulting in a dispersed dataset that makes it very difficult to assess the outcomes and impacts of the approach. Some key variables, such as changes to the tenure fees, have not been tracked at all. This is despite all project partners visiting the hills frequently, sometimes several times per month, and a series of narrative reports (in particular by UEA) being produced. The reports tend to focus on activities done and immediate outputs (e.g., training conducted, SWC activities implemented), but do not provide the **systematic tracking of a set of agreed indicators** that would be required to evaluate the outcome and impact of the approach.

The existing **seasonal agricultural sample survey** implemented by FSP, which tracks several variables that are highly relevant for the Hill Approach (productivity, income, food security), did not differentiate between hill farmers and other farmers, and between plots on hills and elsewhere. This dataset can therefore not be used to assess changes on the hills.

The sustainability and replicability of the approach depend on farmers' and landowners' willingness to invest at least some of their own resources (labor/time and possibly foregone income) into the approach. However, **no cost-benefit analysis** has been carried out of the approach, and the labor of tenants has almost been considered a "free" resource. However, most farmers on the hills have either some land of their own or rent land on other hills, and it is not clear how high the opportunity costs of labor are for them (i.e., what other work they are not doing/what other income they are not earning when working on the hill).

4.2.2 PARTICIPATION OF LANDOWNERS AND TENURE FARMERS

There appears to have been **limited participation of farmers and landowners** in the original **design** of the treatment plans. These were developed by UEA, based on technical considerations. Whilst there appear to have been adaptations at the implementation stage in response to both expert (UEA) and farmer/landowner feedback (e.g., with regards to the species of trees to plant), this seems to have been limited. During the hill visits, most tenant farmers interviewed said that they did not feel competent enough to contribute to the treatment plan design, as they were not familiar with the technologies introduced. They only received training on SWC measures during the implementation phase. This may have contributed to tenants and landowners perceiving the SWC measures on the hills as being "owned" by FSP, making it potentially more difficult to replicate the approach without FSP.

Similarly, there has been **no or limited feedback** to stakeholders (tenants, landowners, village heads) on the results of the research component (soil samples, land suitability study by UEA). This may have contributed to a general sense of the Hill Approach being something done by experts, not something that farmers and landowners could do on their own.

The FFS approach used by FSP appears to have emphasized demonstrations, researcher-led experiments, and adoption, rather than participatory technology development, experimentation, and adaptation. Experiential learning has been a key component of the FFS approach, and suggestions for experiments are meant to come from farmers, not researchers. The FFS approach is thus very different from a conventional, "one-way" transfer of technology approach (see e.g., Talibo 2011). From the UEA reports reviewed, it appears as though the FFS component of FSP was more of a researcher-led demonstration of "improved practices" than farmer-led experimentation of alternative solutions to their priority problems. During discussions with the FSP project team, one colleague reflected that the FFS agenda and program, which originated from the STRESS analyses, should have been better adapted to the needs and interests of farmers on the different hills. This could perhaps have increased the relevance of the approach to farmers and replication levels – but it would have required significant levels of knowledge, skills, and experience in running experiential learning FFS.

Whilst the village heads are nominally members of the COCOVE, they did not always participate actively in COCOVE activities due to other commitments. There appears to have been **limited engagement with local government** and the Local Development Committee (LDC) and the Hill Approach has not been integrated into Local Development Plans (LDP). However, there is scope to integrate specific elements of the Hill Approach (such as tree planting) if there is interest at the local level. This shortcoming had been flagged by FSP project staff already during the first meeting with the consultant (see Annex 3 for details). Whilst village heads were involved during the initial introduction of the Hill Approach, they did not show high interest in being involved in the implementation of the various measures on what is after all private land.

4.2.3 TENURE SECURITY

Perhaps the main weakness of the Hill Approach has been the **inability to secure longer-term tenure contracts** for tenant farmers. Except for Cinjoma (H1), contracts are only annual, with no formal agreement between COCOVE (as representatives of tenant farmers) and landowners on the terms of future contracts. Initially (FSP 2019), it was envisaged that tenants would get five-year contracts. Subsequently, the MoU between FSP and landowners (see section 3.2.4) specified contracts of a minimum of three years, and a lower, more affordable tenure fee. Unfortunately, the improvements in productivity on the hills seem to have had the opposite effect, with five out of nine landowners increasing tenure fees. The current contracts (Annex 10) do not provide any guarantee to the tenant that he/she would be able to continue cultivating the land in the subsequent year, subject to fulfilling his/her part of the contract (i.e., paying the agreed tenure fees and doing the agreed amount of *salongo* for the landowner). The formal tenure contracts in place at the time when this study was undertaken do therefore not really constitute an improvement as compared to the previous, informal arrangements (even before, a tenant would not normally lose access to land halfway through the cropping season – unless e.g., convinced of theft or other crimes). This was discussed with the FSP project team and APC is in the process of developing revised contract formats that include additional safeguards and guarantees for tenants.

This major weakness of the approach is likely a combination of two factors: (1) an **over-ambitious objective** at the start, and (2) an **overestimation of the capacity of the COCOVEs** to negotiate favorable conditions with landowners. It has been very difficult to engage with landowners, most of whom do not reside near the hills, and there has been some turnover of land managers. The original plan to obtain a commitment from landowners to not increase tenure fees (or even lower them) and to issue longer-term contracts was probably over-ambitious, not considering the motivations of these absentee landowners. This is a major lesson for any future replication of the approach – commitments from landowners should probably be the main selection criterion for hills, rather than something that is assumed.

With regards to the COCOVE, their capacity and ability to influence the landowner was perhaps overestimated. Whilst market forces may prevent a landowner from demanding excessive tenure fees – hardly any tenant would want or be able to pay these – the COCOVE alone cannot really put any direct pressure on the landowner and needs to use negotiation and advocacy techniques to convince the landowner. FFS is aware of this and is stepping up activities to strengthen COCOVE and improve tenure contracts. There are significant differences between hills in terms of personality and interest of the landowners, and capacities of the COCOVE.

4.2.4 SUSTAINABILITY AND REPLICABILITY

The sustainability of the achievements depends to a large extent on the capacities and legitimacy of the COCOVE. FSP partner APC is planning to work with each COCOVE to hold elections for a quarter of COCOVE members in November 2022, when the mandate of the original COCOVE will end after three years. It is not clear to what extent the existing COCOVE members will be willing to stand for elections, as they risk losing their mandate and hence certain advantages (e.g., income from the collective field, access to training).[11]

By working only on parts of some hills (where hills were very large and the number of tenants exceeded the number that FSP was able to take on), the project may have unintentionally contributed to the **formation of two classes of tenants** on the same hill – on the FSP part of the hill (with written contracts and SWC) and elsewhere on the same hill (without contracts and SWC). This seems to have caused some friction on some hills. More disconcertingly, it is perhaps an indication of a lack of buy-in from landowners and land managers to the approach. It begs the question of whether landowners consider the formal tenure contracts to be a price they must pay, for FSP to improve the value of their land, i.e., their personal asset, for free. There is clearly still a lot of work to be done to convince landowners that they need to make concessions in return for the benefits received.

Considering all the factors above, the **sustainability** of the approach depends on the ability of the COCOVE to continue mobilizing tenant farmers for collective action and to negotiate favorable conditions for them. On the hills already improved by FSP, the COCOVE have only a limited authority to ensure that farmers will continue participating in the SWC maintenance work – without which the gains made could be reversed. They are also not able to prevent landowners from increasing the tenure fees to a level where those tenants, who invested their labor in the SWC on the hill, are unable to afford them anymore. It is therefore important that FSP makes the best use of the remaining year of the project to further strengthen the COCOVE, ensuring their legitimacy through elections, and developing with them acceptable tenure contracts that protect tenants' rights, while being acceptable to landowners.

In terms of **replication of the approach**, there is currently no strong indication that tenant farmers and/or landowners are interested in expanding the SWC measures to other parts of the hill, or other hills. This issue will require further monitoring from FSP, to document and analyze any cases of spontaneous replication, and to discuss with landowners how they could scale out the Hill Approach to other parts of their hills, or indeed other hills.

11 On H9 (Anastasia), the COCOVE members had called a general meeting of the tenants to "ask" whether elections are required, or whether tenants agreed to extend their mandate. Voting on this was done by show of hands, and most tenants agreed that the COCOVE members can continue in their roles without an (anonymous) election. It is of concern that basic democratic procedures are not being observed on some hills, as it could weaken the credibility and legitimacy of the COCOVE.

4.3 Suggestions for improvement of the approach

4.3.1 TRACKING CHANGES

A main weakness of the approach has been the **absence of a systematic monitoring approach** – which makes it difficult to assess outcomes and impact. As the Hill Approach requires a set of complex interconnected interventions with uncertain outcomes, it is crucial that a set of clear objectives and expected outcomes are formulated – ideally together with landowners and tenant farmers – and progress towards these outcomes is tracked systematically. This could be done in part using participatory monitoring and evaluation methods, involving the tenants, landowners, land managers, and even local chiefs. If set up at the start of the intervention, the collection of baseline information on key agreed parameters could at the same time be used as a training exercise. Local youths could be recruited to use tablet-based tools to record their observations, which may contribute also to a heightened sense of ownership of the interventions. Indicators should cover the main outcome dimensions:

- **Environmental:** E.g., the proportion of land covered by trees and shrubs (or the number of plants per unit area); soil quality; the proportion of SWC works maintained by farmers.
- **Economic:** E.g., crop yields, types of crops grown, the proportion of crop sold, income from grasses and other fodder, and the proportion of farmers using different farming practices.
- **Human/social/institutions:** E.g., nature of tenure arrangements, number, and types of conflicts.
- **Process/output:** E.g., participation of tenants and landowners in the design, performance of COCOVE (e.g., regularity of meetings, ability to mobilize farmers for *salongo*…), the contribution of the landowner to the cost of the SWC measures.

4.3.2 EXPERIMENTATION AND ADAPTATION RATHER THAN DEMONSTRATION AND ADOPTION

The FFS approach used by FSP was designed to demonstrate improved practices, based on the knowledge of technical expertise. While the individual methods and techniques may well have shown promising results at the research station, or even on farmers' fields in other locations, they may not necessarily have been the most appropriate methods for the specific hill. It is well documented that a range of non-technical factors, in particular labor availability and competition between different livelihood strategies, can limit farmers' willingness and ability to adopt specific practices. For example, during the hill visits, some farmers said that the production and use of compost on their hill fields is difficult for them, as it involves transporting biomass over large distances. There is also competition between biomass on the hills used for soil fertility management and for livestock feed. **Using a more farmer-led, experiential learning approach** could address these context-specific issues by giving more control to farmers about the specific constraints they would like to address in their farming system, and the identification of possible solutions based on their local knowledge. This of course does not exclude the option of inviting farmers to a research station to show them different crop varieties or farming practices, or for FFS facilitators to propose additional (to those proposed by farmers) treatments based on their own understanding of best practices.

4.3.3 FAIRER DISTRIBUTION OF BENEFITS AND COSTS/INVESTMENTS

It appears the landowners were the principal beneficiaries from the 18 pilot hills (see 3.1.6 for details of the distribution of benefits). Not only did the project interventions increase the value of their assets, but they also increased the regular income flow (from tenure fees, *salongo*, fodder, and trees) all at no or very little cost to the landowner. It is not clear at this stage whether it would be possible to mobilize landowners to invest more of their own resources in these activities, and if so, what it would take to achieve this. However, with regard to the **selection criteria for hills**, the willingness of the landowner to invest some of their own resources could be included as a key criterion for selection. Provided that the benefits (in terms of the increased value of the land, increased income from a larger number of tenants and from fodder, trees, and other resources, etc.) are documented and lessons from the FSP pilot are widely shared in formats accessible to

landowners, it is not unreasonable to expect a greater contribution from them. This could include committing, before the start of the works, possibly in a legally binding way, to e.g.:

- not increase the tenure fees beyond an agreed limit,
- not demand land rent for a certain period from those tenants who implement the SWC measures on the hill,
- not demand land rent from COCOVE members, in return for them mobilizing farmers for the SWC maintenance works (or possibly even for *salongo* for the landowner).

4.3.4 LINKING FARMERS TO MARKETS

FSP Purpose 1, household incomes increased, includes a range of activities to develop profitable value chains for farmers' produce and to link farmers to markets. This included building the capacity of producer organizations (POs) and market service providers and facilitating links between them. The 18 pilot hills where the Hill Approach was implemented were selected using specific criteria related to land ownership and state of degradation (see 3.2.4 for details), and hence the tenant farmers cultivating these hills were not normally part of the POs established by FSP in its operational area. They, therefore, did not benefit from the value chain development activities under P1 (other than some training on post-harvest operations that was included in the FFS training). As the Hill Approach aims explicitly to increase agricultural productivity, including activities to link farmers to markets would be highly appropriate. This could contribute to sustaining or even enhancing the interest of tenant farmers to maintain and improve the land quality on the hills through continuous maintenance or even expansion of the SWC measures.

4.3.5 REPLICATING THE APPROACH

It is not clear whether or to what extent landowners would be willing to participate in an initiative that requires certain investments from them (or, rather, reduced income – see 4.3.3 above) – in a context where there have been decades of aid agencies investing in emergency operations, requiring little or no inputs from local actors. However, if the approach is to be sustainable, it will be necessary to **mobilize landowners and ultimately the government** to take responsibility for land rehabilitation.

Ideally, this would involve working on **several adjacent hills simultaneously**, to avoid several negative effects when creating a "green island" in a sea of degradation:

- A "green hill" attracts livestock, which could cause damage to farmers' crops.
- If the land on one hill becomes more productive than surrounding hills due to rehabilitation, the demand for that land may increase and encourage the landowner to increase tenure fees, thus disadvantaging those farmers who implemented the SWC measures on the hill.
- It also potentially attracts crop thieves if surrounding hills are degraded and not productive.

Another reason for working on several hills in the same area is that, as discussed earlier (section 2.3), in terms of erosion control outcomes, the Hill Approach is **not the optimum way to tackle surface water runoff and erosion** (despite being appropriate in the FSP context – there being a trade-off between social and environmental factors). In some cases, the achievements of the Hill Approach are being jeopardized by erosion from other hills, e.g., in Cinjoma. However, if these hills are owned by different landowners, mobilizing them to act simultaneously is likely to be difficult.

When expanding activities to other hills, **making use of the skills and capacities of those farmers and COCOVE members already trained** would reduce the cost and increase local ownership of the approach. A refresher training could be organized to ensure that those interested in working on other hills have the technical and social skills to do so. This would need to also include additional training and support in the development of tenure contracts, which are currently highly favorable for the landowner.

4.3.6 EXIT STRATEGY FOR CBOs

The absence of a clear exit strategy for FFS and COCOVE was identified as a weakness in the FSP pilot (see 4.2.4). The technical and social capacities developed are clearly an asset that should be utilized to ensure the sustainability of the approach, as well as its replication elsewhere. Several options had been discussed between FSP and COCOVE members, including **providing COCOVE members with certificates** for the training they received, to enable them to work as private service providers (PSP) for other projects or landowners. This could include both the technical component (designing and implementing SWC measures) and the social mobilization of tenant farmers.

On several hills, COCOVE members have started to build up assets via collective farming activities, sometimes working with other tenant farmers, or by joining or transforming themselves into Village Savings and Loan Associations (VSLA). As project activities on the hills have ended, it is only natural that COCOVE members are looking for alternative livelihood opportunities, and this should be supported. However, the COCOVE is an elected body, representing the tenants on a specific hill, with a limited mandate, after which there is a chance that an individual or all members are replaced during elections. If COCOVE membership is tied to specific income opportunities that are unrelated to the role and performance of the COCOVE, it may result in COCOVE members standing in the way of elections.

Therefore, **alternative mechanisms for rewarding COCOVE members** for their services need to be considered. These could include regular small payments from tenant farmers, or reduced tenure fees for COCOVE members. The latter would be justified in the light of the COCOVE mobilizing farmers to undertake maintenance of SWC measures on the landowner's land, hence providing a service to the landowner which would otherwise need to be provided by a manager in return for some sort of payment.

The sustainability of the Hill Approach will depend to a large extent on the ability to mobilize both landowners and tenant farmers to continue investing time and effort in the rehabilitation measures, whilst feeling that they have a secure and fair share in the resulting benefits. If this balance was achieved, it could lead to more local ownership and less project dependency.

4.4 The way forward

The Hill Approach has brought significant benefits to tenant farmers and landowners alike. Eighteen hills are only a very small proportion of the agricultural land in South Kivu that could be rehabilitated and improved, and there is a huge potential to apply a Hill Approach to large tracks of land that are affected by soil erosion and low productivity.

Considering the impacts of climate change on productivity, it is even more important to develop, adapt, and adopt farming practices that increase resilience to climate change impacts. This could have an enormous impact on food and nutrition security in the region and move communities one step away from relying on external aid for their food needs. However, this would only be possible if landowners could be convinced to cooperate fully, contributing at least some of their own resources to the approach (e.g. by reducing tenure fees in return for participation in the SWC works) and committing to safeguards in tenure contracts.

During the stakeholder workshop, one of the recommendations made was that landowners make larger areas of land available to tenant farmers for the Hill Approach. If tenant farmers were taking on these areas (potentially whole hills) as a group (via a representative institution such as the COCOVE), it would significantly reduce the transaction costs for the landowner/land manager, making it a more attractive proposition to them and to tenants.

Last, but not least, the government of DRC has a role to play by actively promoting sustainable agricultural development on the hills that benefits tenant farmers, increasing their food security and incomes, and reducing the reliance on emergency aid and handouts. In particular, the Ministry of Agriculture could use its influence to promote large-scale adoption of the Hill Approach by facilitating agreements between landowners, farmer organizations, and service providers such as NGOs and the private sector. There is a lot of potential in the area – both in terms of human resources and land – which could be used better, for the benefit of all.

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ANNEXES

ANNEX 1: Scope of Work: Resilient Agriculture Impact Assessment Consultant

Consultant:	**Barbara Adolph**
Project/Consultancy Title:	**Resilient Agriculture Assessment Consultant**
Project Location(s):	**South Kivu, DRC**

BACKGROUND:

Mercy Corps is a leading global organization powered by the belief that a better world is possible. In disaster, in hardship, in more than 40 countries around the world, we partner to put bold solutions into action — helping people triumph over adversity and build stronger communities from within. Now, and for the future.

The Strengthening Capacity in Agriculture, Livelihoods and Environment (SCALE) Award is a capacity strengthening, applied research and knowledge sharing initiative working to ensure that communities and families fully benefit from the U.S. Government's investments in food security programs. Funded by the USAID Bureau for Humanitarian Assistance (BHA), SCALE works to strengthen the impact, sustainability and scalability of BHA-funded agriculture, natural resource management, and off-farm livelihood activities in both emergency and development contexts. Implemented by Mercy Corps in collaboration with Save the Children, SCALE partners with food security implementers and the broader research community to capture, generate, apply and share knowledge to foster more resilient agricultural systems and enhance income opportunities for the world's most vulnerable. SCALE is implemented through the Agriculture Technical Support Unit at Mercy Corps.

Mercy Corps' Resilience Design in Smallholder Farming Systems (RD) Approach guides farmers and communities in adjusting their farm designs in ways that work with surrounding natural systems, improving soil health and water management while bolstering resilience to future shocks and stresses. Mercy Corps is implementing the RD approach in South Kivu, Democratic Republic of the Congo, as part of the USAID/BHA-funded Food Security Program (FSP). Under this program, Mercy Corps implements the approach on hills ("Hill Approach") and works with 18 landowners and up to 135 tenant farmers per hill on techniques to decrease soil erosion, enhance soil health and ultimately increase yields.

PURPOSE / PROJECT DESCRIPTION:

In the implementation of this approach, the Mercy Corps/FSP team has partnered with two local organizations. The Université Evangélique en Afrique (UEA) is a local university based in Bukavu with expertise in environmental rehabilitation. UEA's role includes the collection of baseline data and monitoring of various indicators of agroecological resilience on the hill sites over time including soil composition and fertility, water retention/infiltration, as well as the uptake of agriculture techniques by participants. Action for Peace and Concord (APC) is a Congolese NGO with expertise in governance and conflict mediation.

APC's role is to strengthen the capacity of the Green Hill Committees created by the project to manage the social and community components of the hill approach, and in particular the quality of the relationship between hill owners and small-scale farmers (tenant farmers) and the prevention and resolution of any potential conflict.

A consultant is required to assess the relevance of the hill approach, including in situ observation on hills and analysis of the results of the protection activities undertaken, and their impact on soil conservation and improvement, and increased agricultural production. The consultant will also analyze the relevance of the hill approach from a social and community perspective through consultation with the COCOVE (Green Hill Committees) and local leadership, with particular attention to governance and equitable access to land.

On the basis of observations, consultations and analyses carried out in the field, enriched by the reading of secondary data (periodic activity reports), the consultant will produce a robust evaluation report tracing the history of the approach, capitalizing on the successes and limitations and proposing recommendations with a view to improving the intervention.

The report will analyze the added value of the hill approach in terms of soil erosion, water retention, productivity, land-related conflict and governance and overall resilience of farming communities to environmental shocks with a vision for replication of the approach on a large scale in South Kivu.

The consultant will also advise on the need/opportunity for further support to accompany FSP and its partners in the implementation of the recommendations and to enrich the learning. These additional studies (if recommended) will be funded under a new SOW.

CONSULTANT ACTIVITIES

The Consultant will:

- Develop the methodology for the assessment, including research questions and collection tools.
- Review and analyze secondary data made available by Mercy Corps, data to be reviewed include UEA reports of supervisory visits, as well as the results of analyses of the various soil samples conducted.
- Review and analyze APC reports and other documents related to conflict reduction and improved access to land for smallholders. Other project information pertaining to perceived resilience to environmental shocks and stresses, as defined in the FSP STRESS assessment, will also be reviewed and analyzed, as well as changes in agricultural practices.
- Meet and discuss with Mercy Corps, World Vision, APC, UEA teams and local authorities to gain insight into the approach; to discuss research goals, plans and expectations; and to refine the assessment methodology if necessary
- Visit approximately 9 Hill Approach implementation sites (anticipated 6 in Kabare, 3 in Kalehe), to observe landscaping work and maintenance process, interview tenant farmers and relevant stakeholders (Green Hill committees) and collect additional information based on approved methodology.
- Provide guidance (e.g., verbal observations/recommendations and written in the final report) to UEA, APC and relevant FSP team members on any changes needed in the Hill approach design and implementation to enhance the quality of the interventions over the coming year with a lens toward replicability and sustainability.
- Identify additional impact studies or data collection that could be integrated into the current plans to bolster the evidence base and establish a research implementation plan based on the agricultural seasons in DRC.
- Lead the development of an evaluation report tracing the history of the approach, capitalizing on successes and limitations, and proposing recommendations for improving the intervention and promoting its replication to external audiences, including USAID, DRC government stakeholders, and other relevant partners in DRC and at Mercy Corps headquarters.
- Conduct a workshop to present the evaluation report and preliminary findings to stakeholders in Bukavu for their comments and validation of the study

CONSULTANT DELIVERABLES:

Proposed outputs of this consultancy will include:

- Timeline and management plan for this consultancy
- Revised research methodology, collection tools and implementation plan (including data collection), incorporating any additional proposed studies or data indicators
- Outline of any additional studies to be conducted
- Presentation workshop with slide deck of study report findings for stakeholders in Bukavu (Ministry of Agriculture, UEA, BHA and other donors)
- Final evaluation report on the study carried out, incorporating any feedback from the workshop

REQUIRED EXPERIENCE & SKILLS:

- Fluency in both written and spoken French and English
- Advance degree or at least 6 years of work experience related to agriculture, preferably including knowledge of permaculture, agroecology and/or climate smart agriculture
- Strong research skills and background
- Experience implementing impact assessments in similar contexts and in resilient agriculture technical areas
- Demonstrated ability to lead high level report writing
- Demonstrated ability to work with multinational stakeholders and networks

TIMEFRAME / SCHEDULE:

A maximum of 32 days, May-July, 2022. Consultant must confirm with the SCALE Program Director before spending more than this amount of time on the project.

ACTIVITY	DAYS
Secondary data review	3
Travel	3
Methodology and tools development	2
Meeting with FSP and stakeholder in Bukavu	2
On site visit - 9 Hill and stakeholders	9
Analysis and report	5
Workshop preparation and implementation	3
Report finalization	5
TOTAL	**32**

The Consultant will report to: SCALE Program Director

The Consultant will work closely with:

- Chief of Party for FSP – Mercy Corps
- FSP Agriculture team – Mercy Corps and World Vision
- UEA and APC teams
- SCALE team
- Members of Mercy Corps' Agriculture Technical Support Unit

ANNEX 2: Timetable of the study

DATE	LOCATION	ACTIVITIES				
April / May 2022 (3 days)	London / Washington DC / Bukavu	Document review, briefings with SCALE and FSP staff, development of methodology				
08-09/05/2022	Travel London-Goma					
10/05/2022	Goma / Bukavu	Travel, initial meeting with FSP acting Chief of Party				
11/05/2022	Bukavu	Workshop with FSP team (Mercy Corps, APC, UEA, World Vision) to agree on scope of work, approach / methodology, planning of field activities, finalization of checklists for pre-test				
12/05/2022	Bukavu					
		TRANSECT WALK	FGD FEMALE TENANTS	FGD MALE TENANTS	FGD COCOVE MEMBERS	KII LANDOWNER OR MANAGER
13/05/2022	1. Cinjoma (pre-test)	✔	✔ (8)	✔ (5)	✔ (6)	✔ (owner)
14/05/2022	Bukavu	Analysis of pre-test, adaptation of methods				
16/05/2022	2. Bushanganywa / Kanonzi	(✔)	✔ (10)	✔ (9)	✔ (8)	✔ (manager)
17/05/2022	Bukavu	Documentation, analysis				
18/05/2022	3. Bugugu	✔	✔ (8)	✔ (8)	✔ (7)	✔ (manager)
19/05/2022	4. Mpinga 1	✔	✔ (5)	✔ (7)	✔ (7)	✔ (manager)
20/05/2022	5. Karhondo	✔	✔ (11)	✔ (4)	✔ (7)	✔ (brother of landowner)
21/05/2022	6. Mukasa	✔	✔ (12)	✔ (10)	✔ (8)	✔ (2 owners)
23/05/2022	7. Sangano / Muziralo	✔	✔ (31)	✔ (15)	✔ (11)	✔ (manager)
24/05/2022	8. Celestin Cituli/ Ihusi	✔	✔ (17)	✔ (8)	✔ (7)	✔ (manager)
25/05/2022	9. Anastasia	✔	✔ (13)	✔ (7)	✔ (8)	✔ (manager)
26/05/2022	Katana	Meeting with village heads from 7 of the 18 hills				
27/05/2022	Bukavu	Documentation, analysis, further document review, preparation of briefing session with FSP				
28/05/2022	Bukavu					
30/05/2022	Bukavu					
01/06/2022	Bukavu	Feedback workshop with FSP, discussion of recommendations				
02/06/2022	Bukavu	Feedback workshop with local / regional stakeholders (ministry of agriculture, research and development organizations)				
03/06/2022	Bukavu	Analysis, report writing				
04/06/2022	Bukavu-London	Travel				
06-10/06/2022 (4 days)	London	Writing of draft report, submitting it to FSP and SCALE for review				
Early July 2022 (1 day)	London	Finalization of report				

LEGEND

Desk work (document review, methodology design / development of tools, trip planning, workshop preparations, data analysis, report writing)	14 days
Field visit (nine hills and meeting with village heads)	10 days
Workshops / meetings with FSP staff	4 days
Travel	3 days
Stakeholder workshop in Bukavu	1 day

ANNEX 3: FSP staff and partner perceptions of the hill approach (11 May 2022)

STRENGTHS OF THE HILL APPROACH	WEAKNESSES OF THE HILL APPROACH
ENVIRONMENTAL CHANGES • reducing soil erosion • hillside management • reduction of water and soil loss on hillsides • improved soil moisture and water infiltration into the soil • increased soil productivity • gradual improvement of soil fertility through the different practices implemented by the approach • improvement of the microclimate through the various trees planted in the hill • diversification of animal and plant resources in the concessions where the maintenance works are implemented • improvement of soil cover • replication of practices by the tenant farmers themselves on some hills **ECONOMIC CHANGES** • improvement of crop yields • gradual increase in cultivable areas thanks to development work **HUMAN/ SOCIAL / INSTITUTIONAL CHANGES** • ownership of maintenance work by tenant farmers in most hills • capacity building of tenant farmers on good agricultural practices • guaranteed and secure access to land for tenant farmers • structuring and setting up of COCOVEs • empowerment of COCOVEs and tenant farmers in conflict management, good governance and advocacy • good collaboration and permanent dialogue between tenant farmers and their concessionaires • existence of land rental contracts n most hills • reduction of conflicts between stakeholders	**PROJECT IMPLEMENTATION PROCESS** • Modest or weak involvement of the chiefdom in the problem of access to land by tenant farmers. • Less involvement of some landowners in the follow-up of maintenance works due to their unavailability in the area • Absence of landowners during contract negotiations. **HUMAN / SOCIAL / INSTITUTIONAL** • Non-respect of the conventions established in the rental or collaboration contracts. • Resistance by some tenants to the signing of written contracts and preference for verbal agreements. • Non-ownership of activities by some landowners (wait-and-see attitude) • Change of hill managers leading to non-compliance with contracts and expulsion of tenant farmers. • Slow appropriation of the approach by the actors. • The development of the hills has not directly reduced the cost of renting land. • Persistence of certain conflicts on the hills, notably the crop damage by animals and theft of crops. **SUSTAINABILITY** • The wait-and-see attitude of some tenant farmers who do not yet understand that the objective of the project is to improve the quality of the land. • Difficulty in maintaining the works/devices in the non-exploited parts. • Uncertainty of sustainability after the project. • Slow improvement of soil productivity. • Less use of quality inputs (seeds). • Abandonment of some tenant farmers in the hills due to non-fertile areas. **REPLICABILITY** • Low adoption in terms of duplication of Hill Approach by other landowners.

ANNEX 4: Key performance indicators - data and information availability (based on discussions with Mercy Corps, World Vision, UEA and AFP)

DIMENSION	POSSIBLE INDICATOR	BASELINE (2018/19)	MILESTONE(S)	CURRENT SITUATION (2022)	COMMENTS (AFTER FIELD WORK)
OUTPUT LEVEL					
Extent to which the hill plans have been implemented and SWC measures are maintained by farmers	Proportion of proposed measures implemented; extent to which measures are in working order	Description of hills at start of the project is available from hill plan reports (including drone photos)	Narrative reporting on implementation for each hill (no quantification or comparison of implementation with plan) – UEA monitoring reports	QIVC assessment asks 2 key informant per hill about their perception of SWC activities and tree planting on the hill (see below), but not in relation to what was originally planned. One-off assessment in Nov 2021.	Treatment plans have evolved over time but have not been formally updated. MC / UEA staff were not able to estimate what proportion of the interventions planned have been implemented and are being maintained. Tenant farmers and landowners are also not able to specify this – also because there is no agreed measure e.g., what "improved area" (surface amenagé) could mean.
Extent to which improved farming practices have been adopted	Area / proportion of land (or proportion of farmers) using IPM, applying compost, etc.	No baseline available – STRESS Report includes general description of farming practices in 2017, but not specifically for hills	Narrative reporting on FFS	QIVC assessment asks 2 key informant per hill about the agricultural practices adopted by them (but not representative for all tenants).	Tenant farmers and landowners are not able to specify what proportion of farmers use what practices.
Governance and management mechanisms for Hills	Number of COCOVEs established and their functioning	n/a	None (APC did not assess and report on COCOVE performance)	QIVC assessment asks 2 key informant per hill about their perception of the COCOVE (using a range of criteria)	Tenant farmers, landowners and other COCOVE members commented on achievements and challenges of COCOVEs
Extent of participation of tenants and landowners in the design and implementation	Perceptions / narratives	n/a	Not available	Perceptions of the different groups of tenants and the landowner	Landowners and tenants were consulted, but design was done by UEA
OUTCOME LEVEL					
Soil quality	Soil organic matter, soil organic carbon, Ph, available Phosphorus, Nitrogen	Soil samples were taken in 2018 on several hills, with a report produced on the result	Samples were taken again in 2019. The data is available, but no analysis / interpretation was produced.	A third series of soil samples were taken in May 2022, with the data being made available by UEA immediately.	Possibly the only systematic data available on changes Surprisingly, changes between 2018, 2019 and 2022 show a worsening of some soil quality indicators in some sites.
	Farmers' perception of soil quality	Not available	Not available	QIVC assessment asks 2 key informants per hill about their perception of soil quality on the hill	Farmers on all hills said that soil quality has improved – soil is darker and more fertile due to a combination of soil and water conservation works and application of organic matter.

DIMENSION	POSSIBLE INDICATOR	BASELINE (2018/19)	MILESTONE(S)	CURRENT SITUATION (2022)	COMMENTS (AFTER FIELD WORK)
Number of land-related conflicts	Number of conflicts mitigated by AFD (?)	No baseline	None	None	Conflicts were not tracked systematically
Area under cultivation	Area cultivated on the hill (or proportion of total hill area that is cultivated)	No clear baseline available for all hills	None	None	It seems this has not been monitored. Tenants' and landowners' estimates varied a lot – including both increases and decreases
Proxy for "area under cultivation"	Number of tenants per hill	From landowner (estimate)	Not available	From site visit for 9 hills (landowner estimate), from APC records (not sure how collected)	The information obtained from landowners varies significantly from the information obtained from APC
Productivity of main crops	Yield / ha for cassava, other key crops	Not available	Not available	QIVC assessment asks 2 key informants per hill about trends in production (not productivity) of key crops	Production could have increased or decreased because area cultivated by this crop has increased or decreased (independent of productivity) Anecdotal evidence from all hills that yields have increased.
Profitability of improved practices	Costs and benefits of different improved farming practices and RD dimensions	Not available	Not available.	Not available	We can ask farmers about their perceptions during the hill visits. All groups interviewed on all hills said that it has been worth the effort already now, but they expect even further benefits over time (e.g., because of fruit trees maturing and further improvement in soil quality)
Crop diversification	Number and types of crops grown by tenant farmers	No baseline available – STRESS Report includes main crops grown in 2017, but not specifically for hills	Not available	Not available	This dimension (even though it is key to reliance) seems to not be monitored at all for hill farmers. The main crops grown (cassava, maize, beans) have not changed, but the proportion of cassava appears to have reduced. More people appear to grow vegetables and other high value crops as a result of training and inputs via FFS.
Farmers' knowledge and understanding of improved farming practices	Difficult to collect systematically	Not available	Not available	Not available	This would be interesting, but it's very difficult to assess systematically. All farmers and landowners on all hills spoke about significant increases in their knowledge and understanding, as well as application of improved farming practices.

DIMENSION	POSSIBLE INDICATOR	BASELINE (2018/19)	MILESTONE(S)	CURRENT SITUATION (2022)	COMMENTS (AFTER FIELD WORK)
Duration of tenancy contracts	Number of years for new tenancy contracts started	No contracts: farmers confirm annually with landowner what land they can cultivate. Some farmers exploited same plot for decades.	Not assessed systematically	QIVC assessment asks 2 key informants per hill about their perception of tenancy contract duration on the hill. APC produced a snapshot of contracts in 2022.	We have that information from all hills – duration of contracts has not necessarily increased, but tenure security has and in some cases conditions (fees, *salongo*) have improved due to FSP interventions. Significant differences between APC information and information collected by consultant.
Conditions of contract	Written or verbal, rent, amount of *salongo*	We have that information from tenants and landowner (recall)		We have that information from tenants and landowner	We also have information about the perceived link between any changes and FSP interventions. However, large difference between APC information and information collected by consultant.
Sustainability and replicability of the approach	Extent to which tenants, COCOVE members and landowner think that the approach could be sustained and replicated	-	-	Narrative	Perceptions of different groups on this issue
IMPACT LEVEL					
Food security of hill farmers	Overall food security situation of the household, and proportion of food coming from hill?	Not available	Not available	Not available	No data is collected for farmers on the hills Anecdotal evidence from all hills that production has increased, enabling some farmers to sell a portion and invest in other ventures (mostly livestock).
Income levels of hill farmers	Income from crop sales on hill	Not available	Not available	Not available	
Farmers' perceptions of benefits	Benefits mentioned by different groups of tenants, by the COCOVE members and by the landowner	-	-	One-off assessment	We have that for all 9 villages

ANNEX 5: Checklist for interview with tenant farmers

1. INTRODUCTION

- Expliquez pourquoi nous sommes sur la colline : Pour comprendre comment les interventions du projet ont changé les choses sur la colline, afin que nous puissions en parler aux autres (autres ONG, gouvernement) et qu'ils puissent faire quelque chose de similaire ailleurs.
- Leurs réponses n'auront aucune influence sur ce que fera Mercy Corps sur cette colline. Ils informeront seulement ce que Mercy Corps ou d'autres organisations pourraient faire sur d'autres collines.
- Demandez-leur de bien vouloir parler un par un, sans s'interrompre. Nous aimerions entendre tout le monde, alors s'il vous plaît, donnez aux autres la chance de s'exprimer également. Nous prendrons note de ce que vous direz.
- Nous aimerions avoir de leurs opinions sur :
    - Comment la colline a changé au fil du temps
    - Si ces changements étaient les mêmes pour tout le monde ou différents
    - Ce qui a bien fonctionné et devrait être fait de la même manière ailleurs
    - Ce qui n'a pas bien fonctionné et devrait être fait différemment
- Ils doivent être honnêtes et directs avec nous et dire tout ce qu'ils pensent. Nous ne noterons pas les noms de ceux qui ont pris la parole.

2. CHRONOLOGIE DE LA COLLINE (SITUATION AGRICOLE)

- Nous aimerions connaître la situation sur votre colline au début du projet et actuellement. Veuillez penser à l'ensemble de la colline, pas seulement à votre propre ferme.
- Pour chaque changement, demandez les raisons du changement. Prenez votre temps avec ça - c'est important !. Pour les proportions, utilisez des pierres - 10 est le maximum / 100 %, 1 est 10 %

2.1 Quels ont été les principaux défis auxquels vous (les métayers) avez été confrontés ?

2.2 Quelle proportion de la colline était / est cultivée ?

2.3 Quelles étaient / sont les cultures cultivées sur la colline ?

2.4 Comment étaient / sont la qualité du sol et le degré de l'érosion sur la colline ?

3. PRODUCTIVITÉ

Nous aimerions comprendre comment la productivité de vos terres a évolué depuis le début du projet FSP. Le manioc étant votre culture principale, parlons du manioc. (Utilisez les cailloux pour indiquer le rendement en sacs :)

Rendements de manioc pour la plupart des métayers sur la colline :

3.1 Au début de projet FSP

3.2 Actuellement

3.3. Si différent : Raison pour la différence.

3.4 Meilleur rendement de manioc possible sur cette colline (avec conditions idéales)

3.5. Quel a été le rôle du CEP en ce qui concerne les rendements des cultures ?

4. INTERVENTIONS DU PROJET – CONCEPTION ET AVANTAGES

4.1 Comment et par qui a-t-il été décidé quelles mesures de conservation du sol et de l'eau seraient prises sur la colline et où ? FSP, propriétaire foncier, métayers ? Autres ?

4.2 Les métayers ont-ils eu leur mot à dire sur le type de mesures mises en œuvre ?

4.3 Si c'était vous qui décidiez de ces mesures, l'auriez-vous fait de la même manière ? Si non, qu'auriez-vous fait différemment ? Pourquoi ? Veuillez décrire en détail.

4.4 Maintenant que les travaux sont terminés, quels sont selon vous les principaux bénéfices pour les métayers ?

4.5 Tous les agriculteurs ont-ils bénéficié de la même manière ? Si non, qui en a le plus profité et pourquoi ? (Spécifiez de quel bénéfice).

4.6 Selon vous, quels sont les principaux avantages pour le propriétaire foncier ?

4.7 Quels sont les principaux avantages pour les personnes qui cultivent en dehors de la colline ?

4.8 Combien entre vous cultivent autres terres dehors de la colline aménagée ?

4.9 Quelle est la différence entre ces autres terres que vous cultiver et les terres sur la colline aménagé ? (Spécifiez la différence)

4.10 Est-ce que vous êtes prêts à dupliquer ces pratiques de lutte contre l'érosion de sol dans vôtres autres parcelles hors de collines aménagées ?

4.11 En ce qui concerne les travaux de conservation du sol et de l'eau qui ont été effectués sur la colline, pensez-vous qu'ils amélioreront la qualité du sol et les rendements à l'avenir ?

4.12 Si oui, quand pensez-vous que le montant maximal de l'avantage sera atteint ?

4.13 Pourquoi ?

4.14 Compte tenu de tous les efforts que vous avez déployés dans les travaux de conservation du sol et de l'eau, les avantages que vous avez obtenus méritent-ils les efforts que vous avez déployés (par exemple, planter des arbres, entretenir des tranchées, perdre des terres pour des structures) ?

5. CONTRATS FONCIERS

Pour chaque question, demandez la situation avant le début du projet PSF et la situation actuelle. S'il y a eu un changement, demandez la raison de ce changement.

5.1 Type de contrat d'occupation (verbal / écrit) ; si les deux : proportion approximative de chacun

5.2 Durée des contrats d'occupation (années)

5.3 Loyer par carré et/ou piquet (ou autre unité) de terrain

5.4 Est-ce que le loyer et payé avant ou après cultivation ?

5.5 Survenance de conflits fonciers (rares, occasionnels, fréquents ?)

5.6 Comment pensez-vous que les contrats d'occupation vont changer à l'avenir ?

5.7 Selon vous, que se passera-t-il si le propriétaire actuel vendait le terrain à quelqu'un d'autre

5.8 Quelle est le niveau de la demande en terres ici ?

5.9 Y a-t-il des terres sur la colline qui conviennent à la culture et qui ne sont pas cultivées ? Si oui, pourquoi ?

6. RÔLE DE COCOVE

6.1 (S'ils ne mentionnent pas le COCOVE comme raison du changement des contrats) : Quel rôle pensez-vous que le COCOVE a joué dans le changement des conditions d'occupation ?

6.2 Selon vous, quelles ont été les réalisations du COCOVE ?

6.3 Selon vous, quels ont été les échecs du COCOVE ?

7. CONCLUSION

7.1 Si une autre organisation devait effectuer un travail similaire dans d'autres régions, que pensez-vous qu'elle devrait faire de la même manière que sur cette colline ?

7.2 Que pensez-vous qu'ils devraient faire différemment ? Veuillez expliquer quoi et pourquoi.

ANNEX 6: Checklist for interview with landowner or land manager

1. INTRODUCTION

- Expliquez pourquoi nous sommes sur la colline : Pour comprendre comment les interventions du projet ont changé les choses sur la colline, afin que nous puissions en parler aux autres (autres ONG, gouvernement) et qu'ils puissent faire quelque chose de similaire ailleurs.
- Nous aimerions avoir votre opinion sur :
  - Comment la colline a changé au fil du temps ?
  - Qui a bénéficié de ces changements ?
  - Ce qui a bien fonctionné et devrait être fait de la même manière ailleurs
  - Ce qui n'a pas bien fonctionné et devrait être fait différemment
- Leurs réponses n'auront aucune influence sur ce que fera Mercy Corps sur cette colline. Ils informeront seulement ce que Mercy Corps ou d'autres organisations pourraient faire sur d'autres collines.
- Il/elle doit être honnête et direct avec nous et dire tout ce qu'il/elle pense.

2. CHANGEMENTS PERÇUS SUR LA COLLINE

2.1 Depuis quand êtes-vous propriétaire de cette colline ?

2.2 Quelle est la superficie de la colline [ha] ?

2.3 Avez-vous autres collines ? Si oui, combien ?

2.4 Quels changements avez-vous observés sur votre colline depuis le début du FSP - positifs et négatifs ? Qu'est-ce qui a provoqué ce changement ? Ordre d'importance de ce changement ? Qui a bénéficié de ce changement ? Quelqu'un a-t-il été affecté négativement par ce changement ? (Enumérez-les sur papier dans la langue locale – un changement par papier. Demandez-lui de mettre les changements par ordre d'importance - du plus significatif au moins significatif)

Si le propriétaire du terrain ne mentionne pas les changements suivants, veuillez indiquer :

- Changements dans le niveau d'érosion (augmentation ou diminution ?)
- Modifications de la qualité du sol (augmentation ou diminution ?)
- Changements dans la productivité des cultures (augmentation ou diminution ??)

3. MODIFICATIONS DE LA SUPERFICIE CULTIVÉE

3.1 Quelle était la proportion de la superficie de votre colline cultivable (%) avant le projet FSP

3.2 Quelle proportion de la superficie de votre colline convient à la culture actuellement (%)

3.3 Si la proportion a changé, qu'est-ce qui a entraîné le changement ?

3.4 Quelle proportion de la colline est utilisé par vous le concessionnaire (pour cultivation ou pâturages) ? Est-ce que cela a changé depuis le début de FSP ?

4. CONTRATS AVEC LES MÉTAYERS

Pour chaque question, demandez la situation avant le début du projet PSF et la situation actuelle. S'il y a eu un changement, demandez la raison de ce changement. 4.1 Nombre de métayers sur la colline

4.2 Contrats écrits ou verbaux avec votre locataire ? Si les deux, proportion de chaque.

4.3 Mode de paiement de la redevance ? (Espèce, nature, *salongo*...)

4.4 Montant de la redevance

4. 5 Redevance payable avant ou après cultivation ?

4.6 Durée des contrats (le plus court et le plus long ? Proportion de chaque durée)

4.7 Si vous décidiez de vendre votre terrain, est-ce que les conditions d'occupation pourraient changer ? Si oui, Comment ?

5. RELATION AVEC COCOVE

5.1 Qu'est-ce qui fonctionne bien dans le COCOVE ? Pourquoi ?

5.2 Qu'est-ce qui ne fonctionne pas bien ? Pourquoi ? Que pourrait-on faire pour que cela fonctionne mieux ?

5.3 Que pensez-vous qu'il adviendra du COCOVE une fois le projet FSP terminé ?

5.4 Si vous rencontriez un autre propriétaire terrien, conseilleriez-vous de former un COCOVE sur sa colline ou non ?

5.5 Si oui, pourquoi ? Si non, pourquoi pas ?

6. IMPLICATION ET PERCEPTION DES INTERVENTIONS

6.1 Lors des différentes étapes et interventions du projet FSP sur la colline, comment avez-vous participé ?

6.2 Y a-t-il des étapes et des interventions auxquelles vous auriez aimé participer, mais n'en avez pas eu l'occasion ?

6.3 (si non mentionné, demandez) : Avez-vous participé à l'élaboration du plan de traitement de la colline ? Comment ? L'équipe du FSP a-t-elle pris en compte vos idées ?

6.4 Est-ce que vous êtes prêts à dupliquer l'approche sur les autres collines que vous détenez et ainsi capitaliser les connaissances apprises de cette première expérience ?

6.5 De votre point de vue, qu'est-ce qui était bon dans l'approche utilisée par le FSP qui devait être reproduite ailleurs

6.6 Ce qui n'est pas si bon dans l'approche et devrait être fait différemment ? Comment ?

ANNEX 7: Checklist for interview with COCOVE (Green Hill Committee)

1. INTRODUCTION

- Expliquez pourquoi nous sommes sur la colline : Pour comprendre comment les interventions du projet ont changé les choses sur la colline, afin que nous puissions en parler aux autres (autres ONG, gouvernement) et qu'ils puissent faire quelque chose de similaire ailleurs.
- Leurs réponses n'auront aucune influence sur ce que fera Mercy Corps sur cette colline. Ils informeront seulement ce que Mercy Corps ou d'autres organisations pourraient faire sur d'autres collines.
- Demandez-leur de bien vouloir parler un par un, sans s'interrompre. Nous aimerions entendre tout le monde, alors s'il vous plaît, donnez aux autres la chance de s'exprimer également. Nous prendrons note de ce que vous direz.
- Nous aimerions avoir de leurs opinions sur :
  - Comment la colline a changé au fil du temps
  - Si ces changements étaient les mêmes pour tout le monde ou différents
  - Ce qui a bien fonctionné et devrait être fait de la même manière ailleurs
  - Ce qui n'a pas bien fonctionné et devrait être fait différemment
- Ils doivent être honnêtes et directs avec nous et dire tout ce qu'ils pensent. Nous ne noterons pas les noms de ceux qui ont pris la parole.

2. CRÉATION ET RÔLE DU COCOVE

2.1 Quand le COCOVE a-t-il été créé ?

2.2 Comment le COCOVE a-t-il été créé ?

2.3 Quel est le rôle du COCOVE ?

2.4 Comment les membres ont-ils été sélectionnés ? L'adhésion a-t-elle changé depuis le début ?

2.5 L'adhésion a-t-elle changé au fil du temps ? Si oui, pourquoi ?

2.6 Quels sont les avantages d'être membre COCOVE ?

2.7 Il y a eu beaucoup de soutien pour le COCOVE de FSP. De toutes les choses qu'ils ont faites, qu'est-ce qui a été le plus utile ? Qu'est-ce qui a été le moins utile ? Pourquoi ? (Écrivez chaque commentaire sur une feuille et demandez-leur de les classer du plus utile/important au moins utile/important.)

2.8 Outre les interactions avec le personnel du projet FSP, avez-vous (le COCOVE) eu des interactions (par exemple, visites de conseil, formations, fourniture d'intrants) avec le personnel de vulgarisation agricole du gouvernement ? Ou autres organisations ? Si oui, veuillez préciser.

2.9 Y a-t-il eu d'autres interventions sur l'agriculture sur la colline ou dans cette zone en général ?

2.10 Quelle est la relation entre le COCOVE et le gouvernement local / les autorités locales ?

2.11 Selon vous, quelles ont été les principales réalisations du COCOVE ? (Demandez des détails)

2.12 (Plus précisément, posez des questions sur les éléments suivants s'ils ne les ont pas mentionnés) :

- Le COCOVE a-t-il aidé à négocier des accords fonciers plus longs pour les agriculteurs ?
- Le COCOVE a-t-elle pu superviser et organiser les travaux de conservation des sols et des eaux sur la colline ?

2.13 Quels ont été les principaux défis pour le COCOVE ? Comment les avez-vous surmontés ? (Demandez des détails)

2.14 Quels conseils donneriez-vous au projet s'il devait introduire les COCOVE dans d'autres régions du pays ? Que doivent-ils faire de la même manière, que doivent-ils faire différemment ?

2.15 Vous avez reçu beaucoup de formation et de soutien de FSP. Que pensez-vous qu'il se passera pour le COCOVE quand le projet se terminera et qu'il n'y aura personne pour vous aider ?

2.16 Est-il possible pour les gens sur autres collines de démarrer un COCOVE sans aucun soutien de projet ? Si oui, comment pensez-vous que cela pourrait être fait ?

2.17 Si non, pourquoi ?

3. RÉSULTATS ET IMPACTS PERÇUS ET LIENS ENTRE EUX

3.1 Selon vous, quels ont été les principaux avantages du projet FSP pour votre colline ? (Énumérez-les, puis demandez-leur de prioriser)

- S'ils ne l'ont pas mentionné, demandez :
  - Y a-t-il eu des changements dans les contrats d'occupation
  - Y a-t-il eu des changements dans l'érosion des sols
  - Y a-t-il eu des changements dans la qualité du sol
  - Y a-t-il eu des changements dans les rendements

3.2 À votre avis, qui en a le plus profité – les propriétaires fonciers, les métayers ou les deux ? Pourquoi ?

ANNEX 8: Roles and responsibilities of the COCOVE (Green Hill Committee)

(Source: Adapted from FSP, 2019)

The stakeholders in the hill approach are the landowners and managers, tenant farmers, sub-village chiefs, FFS committees, FSP, group leaders, chiefs, hill neighbors, agronomists.

In its Hill Approach, FSP supports the establishment and capacity building of a Hill Coordination Committees (COCOVE – *Committee de Colline Verte*) on each hill that coordinates and ensure the implementation of planning and help monitor land regeneration with a maintenance plan for the works. These committees act as representatives of the tenant farmers and must ensure that the landowners keep their promises. A COCOVE must embody good governance practices, including having a gender balance, a balance between young and old, between people from the top, middle and bottom of the hill.

COMPOSITION OF THE COCOVE

10 to 15 people, the FFS delegate 2 members of their FEC committee (one male and one female) to be part of the COCOVE.

FUNCTIONS:

1. President or Spokesperson: tenant farmer
2. Vice-Chairman or Vice-Spokesman: tenant farmer from the FFS committees (50% male/female)
3. Secretary: tenant farmer
4. Treasurer: tenant farmer
5. Advisors: local chief (chief of the sub-village where the hill is located), CLD, representative of the landowner
6. The FFS committee members who are not elected to the COCOVE will be committee members, with a maximum of 10-15 people.

If the committee does not include a representative of the landowner, the latter will feel that he is losing power over his hill, and this may endanger the tenant farmers (risk of being chased off the land they use). The aim is not to dispossess the landowner, but for the landowner to offer his tenant farmers more honest and transparent conditions that promote the protection of the soil and natural resources. The idea is to include a representative of the hill owner/landowner in the committee, but he will not be able to vote.

Each tenant farmer on the hill is in a POC. He will therefore refer to his representative on the committee to inform him of any problems encountered, which will be relayed to the COCOVE.

ROLE OF THE COCOVE

1. To provide a link between the landowners, the tenant farmers and all other stakeholders
2. Prevent and resolve conflicts (its role of action is only on the hill concerned)
3. Advocacy with the landowners and other partners
4. Ensure that the rights and duties of stakeholders are respected
5. Negotiate and promote long-term, sustainable, win-win contracts
6. Organize regular stakeholder meetings
7. Plan and supervise the work
8. Coordinate the maintenance of the facilities
9. Potentially set up a warning system and inform the tenant farmers

FSP SUPPORT TO COCOVE

1. Promote the establishment of the committee (elective assembly, council)
2. Strengthen the capacity of members (hillside management and maintenance techniques, advocacy, negotiation, dialogue, conflict mediation, mobilization techniques, etc.).
3. Support this committee in setting up an ROI (internal rules of procedure). The COCOVE must develop, together with the owner, an ROI with a clear definition of the roles and responsibilities of each person as well as a description of sanctions (in the event, for example, of unauthorized cutting of trees, failure to respect commitments made, etc.). FSP is assisting in the development of this regulation, but the content is up to COCOVE and the owner.
4. Potential logistical support (operating equipment)

ANNEX 9: MoU between FSP and landowners

PROCES VERBAL D'ENGAGEMENT DES CONCESSIONNAIRES DANS LA MISE EN ŒUVRE DE L'APPROCHE COLLINE EN COLLABORATION AVEC LE PROJET FSP ENYANYA

L'an deux mil dix-neuf, le-vingt-cinquième jour du mois de juillet, un atelier de concertation sur l'approche Colline avec les propriétaires des collines, s'est tenu à Katana, Hôtel les Rosiers en présence de l'Administrateur du Territoire de Kabare, du représentant de l'Administrateur du territoire de Kalehe, des représentants de la Chefferie de Buhavu et de Kabare, des Chefs de Groupement, des Chefs de Villages. Cet atelier a permis aux propriétaires des collines sélectionnées d'avoir une bonne compréhension sur la vision et les objectifs de cette approche, les différentes démarches techniques et le processus de mise en œuvre de cette approche, le rôle des différents acteurs impliqués, les pistes de collaboration entre le Projet FSP, les participants du Projet et les propriétaires des collines.

A l'issue de cet atelier de concertation sur l'Approche Colline, en tant que propriétaires des collines sélectionnées, **nous nous engageons à :**

- Mettre à la disposition du projet FSP nos collines pour la mise en œuvre de cette approche pour **une durée de cinq (5) ans au minimum** à partir de la signature de ce procès-verbal.
- Accepter les differentes recherches, étude techniques menées dans le cadre de cette approche et la promotion des différentes méthodes et techniques culturales, et ainsi d'aménagement visant à améliorer la qualité et la fertilité de sol, l'augmentation de la productivité agricole, et la préservation de l'environnement.
- Accepter le design technique d'aménagement proposé par l'Université Evangélique en Afrique (UEA)
- Accepter de procéder à un contrat de location plus durable, **au moins trois (3) ans** avec les Comites des Métayers ou les personnes qui louent les parcelles et de proposer un prix de location plus accessible aux participants du projets FSP
- Accepter la mise en place des Comites Colline Verte (COCOVE) dans nos collines.
- Signer un accord de collaboration avec des Comités Colline Verte
- Respecter et honorer les engagements signés avec les Comités Colline Verte.

PV engagement des Concessionaires, 25 Juillet 2019 a Katana

ANNEX 10: Model of tenure contracts negotiated by FSP partner APC

BETWEEN

Mr, Mrs_____

Holder of Identity card N°_____

Located at: Province:_____ /City/Territory _____

Grouping:_____/Village_____ /sub village_____

Telephone_____

Owner of the concession (plantation) _____ that is located in

Grouping_____ Head Office of territory_____

Hereafter referred to as OWNER

AND

Mr, Mrs_____

Holder of Identity card N°_____ Civil status_____

Located at: Province:_____ /City/Territory _____

Grouping:_____/Village_____/sub village_____

Telephone_____

Hereafter referred to as TENANT

IT HAS BEEN AGREED AS FOLLOWS:

Article 1: Purpose of the contract

Mr/Mrs/_____Owner of the concession_____

cedes a portion of land measuring_____m2 or _____Hectare

to Mr/Mrs_____

Article 2: Identification of the portion of land under sharecropping contract

The portion of land ceded by Mr/Mrs (OWNER) _____ to

Mr/Mrs (TENANT) _____

Measurement _____ m2 or_____ hectare

located in the concession_____ Under the identification number _____

Article 3: Destination of the portion of land under sharecropping contract (rights and obligations of the sharecropper towards the landowner)

a. The portion of land is requested by the tenant for development and will thus be exploited by the latter and not left unused without valid reason
b. The portion of land requested by the tenant farmer is intended for food crops and/or market gardening previously determined and agreed between the landowner and the tenant farmer.
c. these crops are _____
d. The crops prohibited for exploitation by the landowner to the tenant farmers on the granted portion of land are: _____.
e. The tenant farmer undertakes to maintain the portion of land allocated to him by applying, where appropriate, soil management using chemical or organic fertilizers, anti-erosion practices and drainage
f. The tenant farmers undertake not to sublet part or all the portion of land under tenant farming or to claim it as their own.
g. (The rights and obligations of the landowner vis-à-vis the tenant)

Article 4: Method of payment of the fee

a. The amount of payment of the tenure fee is previously defined and agreed between the tenant and the landowner and is in figures _____ USD, in letters _____ per year and /or by field work of _____ hours per month and / or in kind _____ after the harvest (delete as applicable)
b. At each payment the grantee gives a receipt to the tenant

Article 5: Duration of the contract

a. The sharecropping contract is concluded for a period of _____ years from _____/_____20. Until _____/_____/20_____
b. The duration of the contract is renewable annually or according to the consensus between the landowners and the tenant farmers.

Article 6: Termination of the contract

a. This contract may be terminated in the event of force majeure or in the event of non-compliance with one or more of the clauses of this contract by a party
b. The termination of the contract must be modified by the requesting party to the other party ideally one growing season before.

Article 7: The method of conflict management

In the event of conflicts between the two parties they undertake to resolve them amicably and if this is not possible, they shall have recourse to the local conflict resolution committees and, as a last resort, to the competent courts.

_____

For the OWNER: Name, Date, and Signature

_____

For the TENANT: Name, Date, and Signature

ANNEX 11: Comments and suggestions from workshop participants regarding the replicability of the Hill Approach

- It will require the intervention of the Congolese state, local decision-makers and a strong participation of the landowners. Because of the existence of the COCOVEs, their continuation and involvement in future actions is essential.
- For organizations working in the area, especially in the agricultural and livestock sectors, land issues must be integrated into all their interventions.
- The state should be involved in encouraging initiatives and mechanisms to protect the tenants, with the landowners signing tenure contracts of varying lengths, as well as sensitizing other landowners in the large-scale adoption of this approach.
- The chiefdom should take ownership of the approach and impose it as a means of managing the hills/large land holdings.
- In view of the advantages of the hill approach, the state should, through a law or an edict, envisage the recommendation of this approach as a practice in the area.
- Encourage landowners to make their large holdings available to tenant farmers for the implementation of this approach. Proposal from the Kabare Chiefdom.
- Raise awareness of the land law and the agricultural code for a better success of the approach.
- Being a state structure, the agronomists of the Kabare chiefdom will have to accompany the community (landowners, tenant farmers and the rest of the community) on technical aspects, especially in the agricultural, environmental, and economic context. They should also intervene in negotiations by playing the role of mediator or facilitator.
- Initiate aspects of terrace cultivation to reduce erosion of the sloping land.
- For the Ministry of Urban Planning through its DIRCAB, it is necessary to organize field visits to other chiefdoms in the province of South Kivu (Ngweshe, Kaziba, Luwinja, Bufulero, ...) to apply this methodology for implementing the Hill Approach, to verify the nature and validity of contracts, to make representations to NGOs such as MC for capacity building and experience sharing and thus to ensure the protection of the physical environment.
- For IITA, the identification of other stakeholders (landowners) interested in the approach is essential, as well as the identification of other organizations implementing similar or complementary actions, with the aim of combining the approaches and thus building on the achievements of ongoing projects or those implemented in the past.
- IITA, through its RUNRES project, can contribute to solving the issue of soil fertilization, i.e., the production of compost and its use.
- For the South Kivu civil society coordination office, state institutions and civil society structures or organizations and other farmers' organizations involved in agriculture should be made aware of the Hill Approach and asked to lobby state institutions to make laws on agriculture and land tenure that can support the replication of the hill approach.
- We propose a diversification of training through trainings and workshops so that we can be able to take charge of our own affairs to fight against the different problems of erosion in the long term. We recognize that as landowners, our role is to secure the tenant farmers by granting them well-defined contracts but also by granting them a large proportion of the land in the future to increase their income, thus guaranteeing a significant reduction in food insecurity.
- As for the tenant farmers, they must pay their annual dues and carry out the "*salongo*" work as stipulated in the contract.
- Mercy Corps should intensify training to ensure that the tenant farmers learn the various techniques to effectively combat erosion and should also plan exchange visits with other hills to present the advantages of the hill approach.
- Extend awareness raising and capacity building sessions for stakeholders (farmers/tenant farmers and landowners), ensure that regulation of a good sharecropping price, easy access to land and increased production, fertilizer, ... However, we as a decentralized territorial entity (chiefdom), have the role of making agricultural monitors available to sensitize the community on this approach.

- CERVO HOLDING, a private company, believes that awareness of the approach should be increased in the community as a whole, and that the scope of other stakeholders involved in the private sector should be broadened through the introduction of co-investment contracts with a duration that covers and guarantees the time of return on investment. CERVO HOLDING is ready to participate in a co-investment model in this hill approach.
- Capacitate the technical teams to accompany the communities in this approach.
- Capitalize on the achievements of the research by creating a synergy of actions carried out in the field with different actors (organizations, tenants, through COCOVE).
- Encourage further research in the field through the universities.
- For a good duplication, it is necessary to ensure a good technical level for the COCOVEs, as well as support for the COCOVEs in terms of initial equipment and a good understanding of the techniques for the development of mini-hills.
- Certification of COCOVEs that have demonstrated a good level of technical expertise in soil management and restoration, recognizing them as genuine service providers in hillside development.
- To replicate the approach, it will be necessary to respect the process of extending the timeframe of the project, given that the changes in terms of hillside management are not palpable in the short term. Thus, the accompaniment of Mercy Corps remains indispensable.
- Facilitate the regulation of the agricultural sector by producing regulatory texts.
- Apply the approach only where it is believed to have the greatest potential for success.
- LOUVAIN COOPERATION will try to implement the hill approach according to its 2022-2026 program in the territories of Kabare, Kalehe and Walungu.
- Accelerate the land reform for the redistribution of land for all land holders under long term contracts which are at the end of their term, which implies a strong negotiation between the ruling power and the landowners. Thus, as the ruling power, we must support this initiative to perpetuate this action for the socio-economic well-being of vulnerable households.