CGIAR Research Program on
Climate Change, Agriculture and Food Security (CCAFS)

Institutional innovations in African smallholder carbon projects

Case Study: Western Kenya Smallholder Agriculture Carbon Finance Project: Vi Agroforestry

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Project's capacity to produce verifiable credits

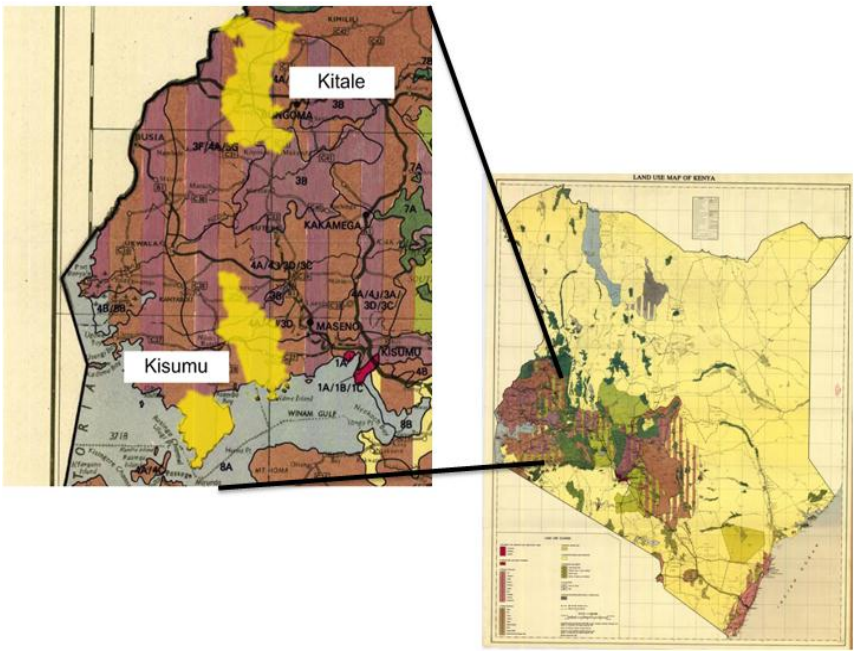
SLM interventions implemented

The sustainable agricultural land management (SALM) practices that are being implemented in this project must be measurable within the "Adoption of sustainable agricultural land management (SALM) by landholders and farmers " methodology under the Voluntary Carbon Standard (VCS). These interventions, primarily in maize-based systems, will include practices that sequester carbon in above and below-ground biomass by increasing soil organic matter (minimum tillage, leaving crop residues on fields, livestock enclosures, composting of manure, compost application on fields), woody perennials (tree intercropping and planting of woodlots), and nitrogen fixing plants. The project also provides opportunities for credits from reducing GHG emissions by limiting biomass burning and NO2 emissions from inorganic fertilizers. In addition to climate-friendly practices, Vi also works with farmers on SLM interventions including water harvesting structures, crop rotations, integrated pest and disease management, and the provision of certified seeds.

Project targets

The carbon project is being built on the experience of Vi Agroforestry's 25-year presence in western Kenya and, in particular, on relationships in the Kisumu and Kitale areas (see Figure 1). The targeted districts for the project are Bungoma, Kisumu and Siaya. The project divisions are Bumula, Malakisi, Sirisia, Wangai, Kombewa and Madiany. For this project to be additional, however, the areas where SALM interventions are being implemented will have to be locations within these regions where Vi Agroforestry has not yet operated SALM programs.

Figure 1: Map of Project Area.



The total project area is 116,000 ha and covers mainly agricultural land (86,000 ha), dense vegetation/forest (20,000 ha), houses and compounds (7,500 ha), rivers (2000 ha) and infrastructure/roads (1,300 ha). The project plans to introduce climate-friendly SALM practices on approximately 45,000 ha, 22,500 ha in each of these two project regions, Kisumu and Kitale. Practices are not anticipated to be adopted on all agricultural land in the project area. The goal will be for 64,800 households to participate. The enrolment period is planned to last 6 years, with a goal of recruiting approximately 10,800 farmers per year. To reach these numbers, each of Vi Agroforestry's 27 field officer

will have a goal of signing up 400 farmers per year into the program. Farmers are eligible to participate if they have the ability to sequester 0.5 metric tons/year of CO2e over the life project, although it is expected that the average will be 0.75 ha/year/farmer (little confusing - different units).

Over the 20 year life of the project, the emissions reduction goal will be 1,236,373 tons of CO2e at 61,818/year and with an average of 1.37 per ha/year. The credits per ha numbers differ between Kisumu (2.0 per ha/year) and Kitale (0.8 per ha/year). (See Table 1). The total voluntary carbon units (VCUs), as credits as called within the VCS, are projected total about 494,549 because of the 60% non-permanence buffer required for the project.

Table 1: Carbon credit production targets (CO2e) without buffer

	Kisumu Project Region	**Kitale Project Region**
Cumulative (over 20 years	898,284	338,089
Average per year	44,914	16,904
Average per hectare per year	2.0	0.8
Total Project cumulative	**1,236,373**	
Per year	**61,818**	
Total Project average per hectare and year	**1.37**	

Adapted from VCS 2010

Progress towards targets

The project signed the Emissions Reductions Purchase Agreement (ERPA) with the World Bank Biocarbon Fund in November, 2010, much later than originally anticipated, the project was operational from January 2009 after a piloting and testing phase. Progress towards targets is just now beginning.

Actors for the implementation of carbon-friendly SLM practices

Vi Agroforestry field officers

One Vi Agroforestry field officer is assigned to each of the project's 27 focal areas. Each focal area includes roughly 12 villages, 20 to 30 groups (more on the group structure in section 0), and each year each field officer is expected to enrol about 400 farmers. When farmer groups express interest, the extension officers provide trainings on carbon sequestering SALM practices. Officers conduct trainer of trainers (TOT) activities, and hold field days to introduce farmers to the project and to demonstrate practices. They also convey information through leaflets, newspapers and radio programs. The Provincial government, particularly village chiefs, also organize public meetings for farmers and Vi Agroforestry staff to interact (see section 2.1 for more on the role of Provincial government). In addition to SALM extension and carbon project management, Vi Agroforestry runs programs in farmer organizational development, marketing and agribusiness management and village savings and loans. Gender is mainstreamed in all community activities related to access and control. The officers also offer capacity building activities that will allow community groups to take over once field officers leave the area.

Community facilitators

Community facilitators act as the primary liaison between the Vi Agroforestry field officers and the farmers groups. They act as a second field officer in a location. They are trained by Vi Agroforestry so that they can provide

extension activities in the area, collect farm data necessary for monitoring, and help to transmit project information down to the individual community groups. They are also the cornerstone of Vi Agroforestry's plans to devolve project responsibility to communities over time, and they are being groomed for this purpose. Community facilitators are paid a small fee for their work, and are reimbursed for their travel expenses. Vi Agroforestry aims for gender balance in the selection of community facilitators. Youth tend not to be selected because of their perceived tendency of leaving home to seek employment in the urban areas.
Compared to men, women are usually a better option in this case since they usually are available for community programmes.

Government extensionists

The presence of an organization like Vi Agroforestry is necessary in the project area, because extension activities have essentially collapsed in Kenya. A survey of farmers in the Lake Victoria area found that 89% of them received no extension services from the government. However, the Ministries of Agriculture and of Livestock do have some presence in the area. These government extensionists do have the mandates to disseminate knowledge on SALM practices, but they are grossly under-resourced. For example, the Ministry of Agriculture in Bumula district has 14 extension agents, and few resources for the agents to implement activities. This is roughly the same number as Vi Agroforestry, but their mandate is larger. There are approximately 26,000 households in the district, so for each extensionist there are roughly 1850 households to cover.

Farmers and farmer groups

Farmers will decide from a menu of climate-friendly SALM interventions which practices will be appropriate for their farm. They will develop and implement a farm plan. Groups will work together to share their knowledge and experiences with various interventions. Through capacity building activities of these groups the importance of balanced participation of women, men and youth in leadership positions is highlighted.

Carbon measurement methodology

The project is developing and piloting the "Adoption of sustainable agricultural land management (SALM) by landholders and farmers " Methodology under the Voluntary Carbon Standard (VCS). This methodology allows for the measurement of above and below ground carbon, as well as emissions reductions within agricultural landscapes. Soil carbon will not be physically measured on all farms, although a sample of farms will be periodically tested. Soil carbon measurements will be modelled using RothC. Trees will be measured using a CDM afforestation/reforestation methodology.

Roles in monitoring

The primary mechanism for project monitoring is the Activity Baseline and Monitoring Survey (ABMS), which is filled out by a sample of participating farmers annually. It collects both GHG related information as well as data on land tenure, land size, crop type, livestock, household cooking and heating, type of shelter, type of roof, water sources, distance to water, water availability, savings, goals of savings, food security, levels of education, on-farm decision making, family size and age structure, and household budgets. The survey is currently in its second edition, as revisions were made based on experiences from the pilot phase.

Vi Agroforestry

Vi Agroforestry field officers distribute the ABMS surveys to farmers. They have a one staff person in the Kisumu office that works on mapping and another on GIS.

Community Facilitators

Along with the field officers, they help community members fill out the ABMS. There is at least one in each location.

Farmers and farmer groups

Farmers self-monitor their carbon-friendly practices by filling out the ABMS and reporting every month. First, they must fill out a form stating their willingness to participate in the project. This form is also signed by the farmer group leader who will ultimately be responsible for collecting the ABMS forms from farmers in the group. The Vi Agroforestry field officer will collect all of the records from the group leaders. Payments will be made to the group based on the ABMS survey submitted by the farmers within it, and the groups will be responsible for distributing payments to farmers. After the project is established, each year 5% of participating farmers will be asked to complete the ABMS.

World Bank Biocarbon Fund

They are supporting the development and testing of the SALM. They have enlisted Unique Forestry Consultants and Joanneum Research, international carbon consultants, as technical advisors on the project.

Project management capacity

Organization of project participants

Project Manager: Vi Agroforestry Programme

Vi Agroforestry has 25 years of experience providing agroforestry advisory services in East Africa. In addition to activities in Kenya, Vi Agroforestry is also active in Tanzania, Uganda and Rwanda. The core business historically for Vi Agroforestry has been provision of extension services focused on sustainable land management's to improve farm productivity. Vi Agroforestry also has substantial experience in convening development stakeholders and conducting joint activities and sharing information with government agencies. (See section 0 for details on Vi Agroforestry's organizational structure.)

Project funders

Project funders include the foundation Vi Planterar trad, the Swedish international development agency (Sida), World Bank Biocarbon Fund

Credit buyer

World Bank BioCarbon Fund

Government stakeholders

Government extension: Ministry of Agriculture, Ministry of Livestock and the Kenya Forest Service
The Ministries of Agriculture and Livestock and the Kenya Forest Service have all worked with Vi Agroforestry in some capacity on this project and will play a key role as Vi Agroforestry transitions to a less intensive management role. These government agencies are also the primary conveners of communities to develop Community Action Plans within focal areas. Theoretically, these inform, and are informed by, divisional, district and national action plans. Communities then identified partners that they would like to work with to address key issues identified in the plans. Recent plans have included action on tree planting and climate change adaptation.

Government regulation: The National Environmental Management Authority (NEMA)
NEMA has national responsibility for environmental protection in Kenya and has been the primary regulatory authority for the project. (For more information on NEMA's role see section 2.4.)

Provincial administration as convener
The Provincial government, particularly the village chiefs, has organized public meetings for Vi Agroforestry staff, farmers and other stakeholders to discuss climate change issues and the implementation of this carbon project. Clan

leaders and village elders have played important roles as interpreters of maps for the carbon baselines. They also play important roles in land disputes, which could be relevant to the implementation of projects (see section 2.5).

Research stakeholders

The Kenya Forestry Research Institutes (KEFRI)
KEFRI's research helps to guide the selection of trees planted in the project.

Kenya Agricultural Research Institute (KARI)
KARI has collected data on soil carbon which can be used in the baseline and monitoring models for carbon projects. They also partnered a Millennium Ecosystem Assessment survey on soils.

World Agroforestry Centre (ICRAF)
Although ICRAF no longer works in the area, their previous research on trees has been used as a guide by Vi Agroforestry and government extensionists for which trees to plant.

Lund University
A PhD Student from Lund University has produced relevant research paper on Vi Agroforestry's work and provided funds for workshop with stakeholders on climate change.

Private sector: Syngenta

Syngenta is a local sellers of hybrid seed and herbicides. The have worked with Vi Agroforestry on trainings and see Vi Agroforestry as an intermediary allowing them to reach more farmers. They sometimes extend credit to farmers for their products. They are likely other sellers in the area, but they seem to be most active.

Community Institutions: Umbrella groups, small groups and community facilitators

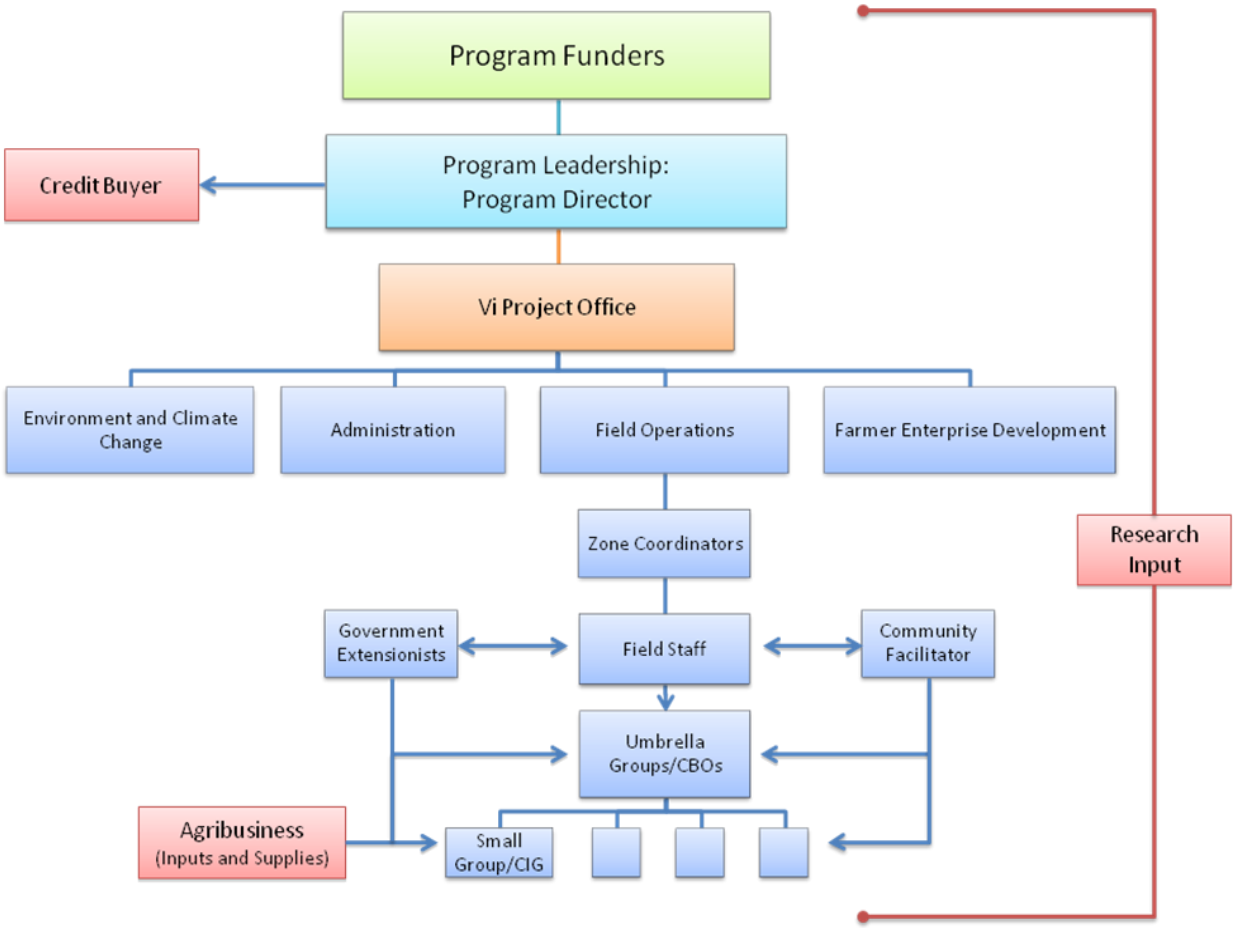
Small groups/Community Interest Groups (CIGs)

These groups are the smallest unit of organization within the carbon project. This is the level at which the carbon contract is signed. Most of these started as groups serving community support (providing for orphans), production (joint production or marketing) or financial (village savings and loans) functions, and the structures are being leveraged so that their members can participate in the carbon project. Most have membership fees and elected positions. The existing groups help to identify new ones for the project.

Umbrella groups/Community Based Organizations (CBOs)
Umbrella groups are coalitions of smaller groups that interact together with field officers and pay the community facilitators. These groups may be already established livelihood or religious organizations that have sub-groups throughout the area. The groups are usually governed by elected officers. (See section 2.4 for elaboration and examples.)

Community facilitators
See previous sections for information on Community facilitators

Figure 2: Project Structure.



The project process and timeline

2007: The initiation of the project from the World Bank Biocarbon Fund which approaded Vi Agroforestry. Vi Agroforestry developed an organizational strategy to work on climate issues, and decided that they wanted to develop a carbon project. While Vi Agroforestry was developing a strategy, the World Bank Biocarbon Fund was looking for an agricultural carbon project in which to invest. The Biocarbon Fund approached Vi Agroforestry and the groups began to work together to develop the project. The project region was chosen because it met a set of poverty, food security and environmental degradation criteria developed by the groups. Also, the area had very little access to government services, and there were no major NGOs operating in the area. Vi Agroforestry and the World Bank were interested in developing a project that would test the notion that carbon finance projects could be developed with farmers in very poor and very degraded rural areas and that they could successfully and profitably create carbon credits from soil carbon. Once the site was chosen, project managers and staff were hired and Vi Agroforestry began preparing the initial project documents. Vi Agroforestry receives pre-financing from Sida for local mobilization for the project and to engage communities.

2008: Vi Agroforestry continues to develop project documentation and baselines. Vi Agroforestry also approaches stakeholders of the region and introduces them to ideas for a carbon project and work on climate change adaptation and mitigation generally. This information is passed along to communities. Vi Agroforestry reaches out to political leaders through letters including Members of Parliament (MPs) and counselors.

2008: The carbon baseline is established and Vi Agroforestry field staff start to recruit farmers and train them on various aspects of SALM and climate change.

March 2009: The implementation of carbon monitoring and farmer self-assessments begins. The initial iteration of the assessment turned out to be very tedious, so it was modified to take the form of the Activity Baseline Monitoring Survey (ABMS) that is currently being used.

January 2010: The crediting period begins; Environmental and Social Assessments are completed.

November 2010: World Bank Biocarbon Fund signs Emissions Reductions Purchase Agreement (ERPA) with Vi Agroforestry to buy credits generated from the project.

2012: The first Verified Emission Reductions (VERs) are expected to be delivered, along with the first payments to farmers.

2017: The project plans will enroll its final households. Vi Agroforestry plans to do a direct extension in a given area for 3 to 6 years. The carbon contracts will run for nine years, but money for the credits will flow for 20 years. A primary goal during the intensive 3 to 6 year phase is to develop the capacities for community-led project management systems based on strong community organizations with democratic principles that would allow communities to run the carbon project on their own. Eventually ViAgroforestry's responsibilities would include backstopping on monitoring and financial intermediation.
2029: The crediting period ends.

Project management capacity

Vi Agroforestry staffing structure

Organizational Units
Vi Agroforestry implements a variety of programs outside of the carbon project, and its organizational structure allows for this range of activity. The operation in western Kenya, headquartered in Kisumu is split into four units: 1) An administrative unit which deals with organizational management and finances; a field operations unit which oversees the zone coordinators and supervision of staff; a farmer enterprise development unit which works with groups of farmers on a demand basis; and the environment and climate change unit which oversees the carbon project development and carbon monitoring.

Program Director
The program director has primary responsibility for the carbon project, negotiates and coordinators with buyers and manages the relationships with the World Bank BioCarbon Fund.

Project managers and deputy project managers
They are responsible for field staff and coordinating the collection of information for carbon monitoring.

Zone coordinators
The zone coordinators oversee the field staff within each zone.

Field officers
Vi Agroforestry has 27 field officers that cover each of the 27 locations within the project area.

Organization of project participants

Organizational capacity

Vi Agroforestry's long-standing presence in the project area has provided them with the necessary organizational stability to lead this project. Carbon is a relatively small component of their total development activities in the area, and they have therefore been able to withstand the logistical, technical and financial challenges that this project has presented.

Vi Agroforestry's credibility in the region has also positioned them to play the convening role required to lead this work. The nature of the project requires that they engage a wide variety public, private, and community based stakeholders. In this process, they have been able to overcome skepticism on behalf of some farmers because of previous negative experiences they had with other NGOs in the area. They have successful engaged the provincial administration, have explained the carbon project concept to local political and community leaders.

Vi Agroforestry has also put significant resources into the development of Kenyan staff. Some of them have the opportunity to receive training in Sweden. There is also a cohort of project staff that have significant experience attending international climate policy meetings and working with international research projects. These experiences allow these staff to explain the full project context to participating community groups and farmers.

Community structure and governance

As described in section 2.1, there are two major levels of community-based organizations for carbon projects, the umbrella groups and the small groups, or community interest groups (CIGs). These groups are linked to the Vi Agroforestry management structure through the Vi Agroforestry field officer and the community facilitator which works with Vi on extension and monitoring, but also represents the community's interests within the project.

There are a variety of histories and shapes of these groups. Most of those that Vi Agroforestry works with existed before the project and are overlaying the carbon project on their pre-existing organization structure. A generic organogram of these community groups is presented in Figure 3. Here are some specific examples:

The Wagai Integrated Farming Programme (WIFAP)
WIFAP formed in 2005 with the goal of mobilizing farmers to promote agricultural production and food security. It is comprised of 125 groups with membership ranging from 10-30 people. It implements projects on beekeeping and fish farming. WIFAP has bank accounts, although some of the smaller groups do not. For the carbon project, it has collected data for the baseline survey of the level of uptake of SALM practices.

Kimeiti Farmers CBO
The vision of this group is "a strong organization offering services to farmers in the whole location." Their activities include agricultural production (group farming), marketing (group marketing), capacity building (forming partnership with extensionists and other outside groups) and financial services (village savings and loan groups and rural/village banks). Forming the larger group are approximately 25 farmer CIGs that have existed for 5 to 10 years. These CIGs are formed when five farmers come together and decide that they want to initiate a set of joint activities. They can grow in size afterwards, but this is the minimum. The purpose of the CBO is to plan together, but the CIGs implement the activities. Smaller groups of the CIGs come together in an area and form a block. These blocks collaborate on joint trainings and marketing activities. There are 6 blocks within the Kimeiti location. Group members are aware of Vi Agroforestry climate activities and have been trained in SALM practices including minimum tillage, composting manure, mulching with crop residue, and careful use of agrochemicals and fertilizers.

Inter-Christian Fellowship Evangelical Ministries (ICFEM)

ICFEM is a Kenyan missionary organization that has been operating in western Kenya since 1989. The Kimieti local unit arrived about the same time as Vi in the area, and they have worked well together on development activities. Fellowship groups are in the range of 25 to 40 members. There are now 80 of these in the area. Each fellowship has five executives. The fellowship leaders are trained directly, and they are responsible for training their members. Each fellowship has an agricultural coordinator, but also provides services on education, health, credit and sports. A Vi Agroforestry agent first approached them about the carbon project in 2009.

Rural Energy and Food Security Organisation (REFSO)
REFSO started work in 1999 and works on traditional orphan crops including cassava leguminous crops, cashew nuts, bananas, millet and sorghum. The organization is comprised of five groups with about 30 members in each. They developed cuttings of these crops that are distributed to members of the group. They work as a collective marketing group, and a portion of the proceeds from each farmer's harvest is returned to the members. Each of the

five groups has received climate change trainings from Vi Agroforestry and has begun to implement climate-friendly SALM practices.

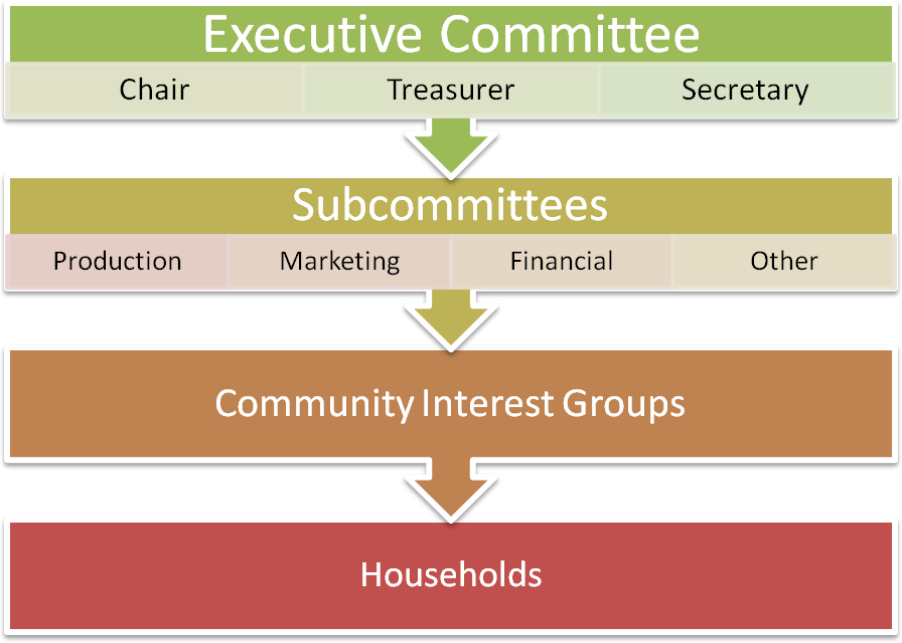
Ngoli Adult Learning Group

Group started in 2003 and has currently has 53 members. This is a CBO made up of six small groups and meets every Monday. The vision is "A healthy, wealthy community". Group activities include agroforestry tree planting and manure composting. The group has planted 1700 trees in the past nine months and has 30,000 seedlings in the nursery. The group reports that their interventions have increased maize production from 5 bags per acre to 11 bags per acre since group activities began. In 2009, a Vi Agroforestry project officer visited them for the first time to discuss the carbon project.

Community roles in project management

Individual farmers do not have direct influence on project decisions and they cannot negotiate carbon prices. Their primary choices are whether or not to participate and which farm interventions to implement. The community facilitators are the direct lines of communication between the communities and the carbon project management staff. Vi Agroforestry anticipates devolving project management power to community groups after a period of intensive extension work. For most of their interventions, this period is 3 to 5 years, but it may end up being longer in this case.

Figure 3: Structure of a generic umbrella group.



Gender

Women are included in project climate change sensitization and implementation activities.
Women provide most of the agricultural labor, and their knowledge on composting, tree planting, residue management, manure management and fertilizer application is critical in the project. However, it is likely that they will end up with extra work that is required for agricultural interventions. Some work may be harder as a result of the project, but some may also be easier. On the one hand, cover cropping and residue management may require increased work for women. On the other hand, tree planting for firewood will reduce the time that women spend gathering firewood, and improved water harvesting reduces time spent by women collecting water. The project promotes water management for household and agricultural uses. Improving the efficiency of livestock production will also reduce labor intensity for women. Upgrading of livestock in KACP for emission reduction would support women to increase animal products, yields, income, food and nutrition security, reduce labour intensity, time

Men are regarded as the owners of land in the area, and title is normally issued in the name of the man. Women can own land, but only after their husband dies. Under the new constitution, equal ownership right are allowed for women. Women generally own the small animals, but they are able to buy larger ones if they have the money. Recently the number of community-based women's groups in the area have increased, along with their rights. A relatively recent development for women in this area is that they can now plant trees for lumber/firewood and also for food, such as bananas. Women own annual food crops and kitchen gardens.

At the household level, most agricultural decisions are made together by men and women. This includes what is to be produced, how it is produced, and how the returns will be spent. Women and children provide most of the family labour. For this project, members of the community are advised on how to value this work.

At the group level, women hold leadership roles, and there is affirmative action to reach leadership balance. Some contracted groups are self-help groups for women. The project supports the empowerment of women. It buys carbon from women as long as they own the land. Trainings are focused on valuing all work done by both men and supporting Farmer Enterprise Development for women to participate more in business. Women are hired as field agents for the purpose of reaching out to women. Vi Agroforestry also makes an effort to work with women community facilitators and women social worker collaborators. Many trainings are targeted specifically for women and take place in the afternoon when they are available.

Key policy issues

Land tenure

Ownership delineation problems are not anticipated in the project area. The ownership of land was adjudicated and legally assigned to individual land owners after consolidation and demarcation in the mid 1950's. Land in the project area, as in the rest of the region, is under freehold titles, which is only transferable through sale or inheritance. This ownership arrangement gives landowners the control over resources necessary to participate in an agricultural carbon project. While land boundaries are generally respected, the charge for obtaining title deeds is high, and not all farmers have them. This occasional lack of documentation notwithstanding, land policy in the project area is more conducive to carbon project development activitiy than other Lake Victoria countries where Vi Agroforestry has a presence (Rwanda and Uganda). In fact, land tenure was one of the key reasons this area was chosen to pilot an agricultural carbon project.

Carbon Rights

International rules do not stipulate who has the right to benefit from sequestered carbon or emissions reductions. Policies on this topic are left to the host country. Although many countries have yet to address the legal status of carbon Kenya already has some experience with this issue with a number of land use carbon projects already in operation. As part of the project development process the have received a letter of no objection from NEMA, so it does not seem as though there is significant risk that land users in this project will loose their right to carbon during the contract period.

Regulations

NEMA is the national developer and enforcer of environmental regulations. However, they are very thinly staffed with only a single staff member per division in the project area. At the location level, NEMA has virtually no presence. One local chief did not realize that they operated in the area at all. For this project, Vi Agroforestry completed an Environmental Impact Assessment (EIA) which NEMA was responsible for reviewing along with experts in the other line ministries include agriculture, water, public health and the Kenya Forest Service. NEMA may also be responsible for helping to resolve the additionality implications of Kenya's new mandate for 10% tree cover on farms.

Kenya climate change response strategy

Climate change policy has been developed at the national level, but has yet to be implemented at the local level. One major focus of this project has been tree planting, but so far it has not addressed soil carbon directly. NEMA is Kenya's lead agency on forest carbon, but it is not clear whether they will also be regulating agricultural carbon, or if it will be the Ministry of Agriculture.

Environmental planning processes

A District Environment Action plan was created in 2008 with major issues being identified as waste management, riparian system protection and reduction of fuelwood use. This process was shepherded by a District Environment Committee that has membership from government ministries, CBOs and NGOs. The district plan feeds into the National Environmental Action Plan. Regulations have been created based on these planning processes, but there is virtually no enforcement, and climate change is not directly addressed in these regulations. The new constitution will shift administrative boundaries, and these action plans will need to be revisited. To further complicate matters, the new Constitution has split the country into counties, a new administrative distinction for Kenya. The structure of the management of these counties is not solidified and they do not yet have any resources.

Land conflict resolution

Most land conflict resolution is handled by the local provincial governments. Clan elders work under the chiefs, and each clan has a chairman who deals with land disputes. This system resolves roughly 70% of the conflicts. In cases where this system is insufficient, tribunals of elders are established. That being said, the clan structure has slowly been breaking down in the area as youth move to the cities in search of jobs. The village leaders now fulfil most of the administrative roles in the village while the clan leaders, under the provincial administration, play important family and dispute resolution functions.

Interaction with landscape scale processes

The project is located within the Lake Victoria Basin, which contains an abundance of water resources including large rivers, wetlands and springs as well as Lake Victoria itself, the second largest fresh water lake in the world. The basin is under substantial environmental threat from agricultural land degradation, deforested and degraded water catchments, agricultural chemicals and urban waste. A majority of the people in the Basin live in poverty. Vi Agroforestry is in communication with the basin's watershed-wide management initiatives.

The Lake Victoria Environmental Management Program (LVEMP), a project of the Lake Victoria Basin Commission (LVBC) is designed to improve collaborative management of the transboundary natural resources of Lake Victoria basin and to reduce environmental stress in degraded and polluted target areas to improve the livelihoods of communities that rely on the basin's resources. Components of LVEMP's work include the support of sustainable soil and water management practices for watershed restoration and the coordination of institutional and policy development in the basin. There are many potential linkages to the Vi Agroforestry carbon project. It has developed a memorandum of understanding with KARI to develop institutional capacity to implement and carbon projects.

Institutional challenges and solutions

This project was designed to be a trailblazer. As the first carbon project to develop credits for soil carbon and one of the first to work with poor farmers, this project presents a number of unique challenges to both the project manager as well as to communities and farmers. The background economic, demographic and environmental challenges of widespread poverty, increasing population density, increasing land fragmentation, land degradation, unreliable weather patterns, a general drying trend, and volatile agricultural markets intensify risks for all project stakeholders. This section describes some the most significant challenges and identifies potential mechanisms for them to be met.

Project challenges and solutions

Farmer Expectations
Challenge: When the idea of carbon payments is first explained to farmers, expectations are often raised for levels of payment that will not be met. This could lead to disappointment, resentment and an erosion of trust between communities and Vi Agroforestry.
Solution: Vi Agroforestry staff must emphasize the benefits from improved yields and other co-benefits from the beginning, and be very clear about the expected level and timing of payments.

Devolving responsibility
Challenge: The long-term financial success of the project will be based on the transitioning of management responsibilities away from Vi Agroforestry staff to community organizations. Most of these groups will have management structures when the project begins that are insufficient to take on this responsibility.
Solution: The importance of participatory planning throughout the project should be emphasized, and concentrated efforts should begin early to build management capacity for community groups and to train community facilitators to be future project managers.

Constitutional changes
Challenge: The new constitution in Kenya will alter national and local government structures, and this period of transition may create insecurity within the projects about the stability of government institutions necessary for it success.
Solution: Vi Agroforestry should continue to focus on communicating with national level regulatory agencies that will likely remain in charge of approving carbon projects in the country. If there are signs that the current structure will significantly change, Vi Agroforestry can try to inform these changes and remain responsive to any requests from regulators.

Farmer skepticism of NGOs and introduced SALM practices
Challenge: Some farmers have had negative experiences with NGOs in the past and consequently are initially distrustful of the project. There may also be cultural barriers that hinder the transition to new practices, or other reasons farmers don't want to participate. For example, certain SALM practices require increased labor.
Solution: Vi Agroforestry has a 25 year track record in western Kenya and a strong reputation. Demonstration plots and other knowledge sharing activities can be helpful in overcoming skepticism regarding practices. If there other reasons farmers do not wish to participate, those reasons should be respected.

Delays with World Bank Biocarbon Fund
Challenge: Working with the World Bank Biocarbon Fund on its first soil carbon project has been a very slow and often frustrating process. Project timelines have been delayed on multiple occasions.
Solution: This project is the first of its kind, and some delays should be expected. The ERPA was finally signed in November 2010, so the project can now commence.

Trees on farm mandate
Challenge: Kenya has developed a national mandate that 10% of all agricultural land should be covered by trees. There is an open question as to whether this mandate will affect the claims on additionality of trees planted on farms for the purpose of the project when a farm has less than 10% tree cover.
Solution: This is an issue the needs to be clarified at the national level.

Pre-financing
Challenge: If the project is to expand beyond current plans, it will need to locate pre-financing that is not currently available in carbon markets for VCS credits.
Solution: Because of Sida's pre-financing support and the World Bank's commitment to buy credits, this has not been as major an issue for this project as it has been for others. If Vi Agroforestry decides to start another agricultural carbon project, perhaps they will explore using a carbon standard that issues ex-ante credits, such as Plan Vivo.

Community/farmer challenges and solutions

Lack of knowledge
Challenge: Among many farmers, there is a general lack of knowledge about climate change and certain SALM practices. Coupled with the complexity of reporting on the implementation of these practices there can be significant barriers for farmers, many of whom are functionally illiterate, to participate.
Solution: Vi Agroforestry expects an intensive period of extension at the start of the project in which it will spend most of its allotted budget training farmers to participate in the program (see section X for budget details). This intensive period is still underway, and because this project is the first of its kind, it is still unknown precisely how much effort will be required by Vi Agroforestry to build sufficient capacity for farmers.

Lack of organizational cohesion
Challenge: Some community groups will be participating in the project will not begin with sufficient organizational and leadership capacity. This will have to be developed.
Solution: Vi Agroforestry should focus its efforts first on working with organizations that have strong leadership. After this, the solution will be more intensive training.

Community organization disruption
Challenge: The pre-existing community structures that provide stability to communities may be disrupted by new structures for training, monitoring and cash distribution that are introduced for the purposes of implementing the carbon project.
Solution: Organizational development for carbon projects at the community level should be led by the members of democratically run community groups. These groups can best decide how to integrate new activities into pre-existing structures.

Payment disputes
Challenge: Even with strong, community-based organizational capacity and thoughtful community group management, the potential for cash payments still increases the potential for disputes. These conflicts could arise between small group members as they decide how to distribute payments, or within families between the male titleholders and the female who manages the land.
Solution: Payment systems within groups should be clearly decided at the beginning of the project. Where conflicts arise at the time of cash distribution, local provincial government leaders could play the role of mediator as they do with land disputes. (See section 2.5.) Intra-family issues might also be mitigated if both men and women are involved in planning processes from the beginning. Gender distribution should also be negotiated and decided early with a clear involvement of men and women. Interventions should consider the social and cultural practices in a community. Interventions that supported woman-oriented work such as growing cover crops and residue management will be a benefit as long as labor requirements aren't too high.

Project Innovations

The Vi Agroforestry project is, in some senses, a proof of concept project. It was created to develop and test a methodology that allowed for emissions reductions and carbon sequestration throughout an agricultural landscape to be credited in a single project. This has become the "Adoption of sustainable agricultural land management (SALM) by landholders and farmers " methodology. Beyond the technical elements of the project, however, the project faced similar organizational challenges as other land use carbon projects that have dealt primarily with trees. All of these projects have to develop cheap and effective mechanisms to provide extension services and build capacities for community level monitoring of interventions.

The challenge for Vi Agroforestry has been greater because of the relative difficulty of introducing and tracking a suite of SALM practices that includes conservation tillage. For tree-based projects, this process is relatively easier. Systems for tracking the carbon in trees on farms are fairly well developed, and farmers are already familiar with tree-planting practices. Conservation tillage systems, for many farmers, are entirely new and represent a much more significant transition for farmers than tree-planting alone. If this project is successful, it will open up opportunities for similar initiatives throughout the world.

Project finances and equity for farmers

The project costs and benefits

Project costs

Table 2 summarizes Vi Agroforestry's projected costs from the beginning to the end of the project. The vast majority of this amount will go towards operations after the first SALM practices have been implemented. These operating costs will not be uniform throughout the project's lifespan. There will be two distinct phases of intensity for Vi Agroforestry's engagement, represented in the table as Phase 1 and Phase 2. Costs for implementing Phase 1 ($US1,026,000) will dwarf Phase 2 ($US162,000). The key difference between these phases is the level of staffing that will be necessary for Vi Agroforestry to run the program. In Phase 1, the project will support one extension agent for each of the 27 project locations and will require one supervisor for every 14 advisors. In Phase 2, it is projected that there will be only one Vi Agroforestry extension advisor needed for each of the 6 divisions in the project area. During this period, Vi Agroforestry expects to devolve project responsibility to community organizations.

It is likely that the intensive Phase 1 period, assumed in this calculation to last 3 years, will last longer. Vi Agroforestry managers have indicated that the project may need a Phase 1 level presence for 5 to 10 years. But the message that can be drawn from the enormous difference in projected costs between the two phases is that the financial success of this project from the developer's perspective lies mainly in the project's ability to quickly and efficiently devolve responsibility to community organizations.

Table 2: Summarized project costs

Projected Costs	**Amount (US$)**
Preparation costs (feasibility studies, monitoring plan, PDD, etc.)	50,000
Establishment costs (site and soil preparation, seedlings, planting, weeding until planting is completed)	50,000
Operating costs for Phase 1 (year 1-3 after practices have been implemented)	1, 026, 000
Operating costs for Phase 2 (year 4-6)	162,000
Others (carbon validation, 3 times - 2011, 2014, 2017)	172, 000
Total	**1,460,000**

Adapted from World Bank Carbon Finance Unit (2008)

The importance of staffing costs in the project budget is further clarified in Table 3, summarizing the relative budget percentages of Vi's project costs.

Table 3: Breakdown of project costs by percentage

Planned Costs	**% of costs**
Salaries for Vi Agroforestry staff,	60
Logistics/transport	15
Training/capacity building of staff	10
Seeds and seedlings	5
Other (insurance, office rent, electricity)	10

Adapted from World Bank Carbon Finance Unit (2008)

It is difficult to conduct a full cost accounting of this project, because organizations other than Vi Agroforestry have made substantial contributions and significant investment in building institutions before the start of the project. Vi Agroforestry has been operating in western Kenya for 25 years and has developed significant experience and credibility among communities in the region on SALM practices as well as other development activities. The SALM methodology development and testing has been covered by the World Bank BioCarbon Fund. Sida provided pre-financing for the project which could not have been secured in private carbon markets. Vi Agroforestry anticipates that the project will eventually break even and make money over the long run, but this would not be possible without these key investments.

Project benefits

At US$ 4 of carbon, the carbon credit value per ha is very small. However, taken as a whole the project has potential to generate significant revenue. The yearly revenue, using carbon credit production figures from Table 1, for the project would be US$247,272, and over the life of the project, this would be US$4,945,492. (US$1,978,197 with 60% beuffer set aside.) This revenue could increase if the price of carbon increases or if the accuracy of measurement improves over the life of the project from tier 1 to tier 2 or 3.

The cash revenue from carbon credits is projected to be distributed between farmers groups (60%), Vi Agroforestry extension operations in the project area (30%) and Vi Agroforestry headquarters in Stockholm to cover administrative costs (10%). Farmers groups receive payment according the carbon they deliver based on the ABMS survey. Groups make their own arrangement for distributing cash to member farmers. These payments have not yet been made and the structure of the specific payment mechanism from Vi to the groups and from the groups to the farmers has not yet been determined. Vi Agroforestry is planning to develop the payment mechanisms to groups in January 2011, and each small group is responsible for designing its own distribution systems.

Even under the conditions of the model described in this section, Vi Agroforestry would still come out ahead over the life of the project. The 3 sources of financing for the project, summarized in Table X are Vi Agroforestry, Sida and farmers. Vi Agroforestry's 32% share comes to US$ 466,550. At 40% share of total revenues for field operations and Stockholm headquarters, their total would be US$ 1,978,197 over the life of the project. (US$791, 299 with the 60% buffer.)

Table 4: Sources of project finance

Sources of Finance	**Amount (US$)**
Vi Agroforestry	466,550 (32% of costs)
Sida	552,000 (38% of costs)
Farmers	441,450 from their portion of the carbon revenue (30% of costs)
Total	1,460,000

Adapted from World Bank Carbon Finance Unit (2008)

The farmers' costs and benefits

A key principle for this project is that farmers will be better off participating even if they receive no cash payment from carbon credits. The most significant cost for them will be the time it takes to learn about new practices and the

labor requirements to implement a conservation tillage system. They may also choose to invest in tree seedlings or other seeds.

The cash benefits that will come to them will be relatively small. It is estimated that each farmer will have roughly 0.75 ha in the project. Using Vi Agroforestry's projected average figure of 1.37 tons of CO2e/ha for Kisumu and Kitale, and $4 per ton of CO2e, the project could create US$4.11. Farmers only receive 60%, so an average farmer would receive US$2.47 per year. The remaining US$1.64 goes to Vi Agroforestry and is essentially a payment to Vi Agroforestry for the extension and carbon project management services that they provide.

The most significant benefits will come from increasing yields and agricultural profitability. In the absence of the project, the productivity of the agricultural systems will likely continue to decline. As the rates of per capita arable land decrease, additional pressure will be placed on degrading soils. In general, SALM measures will improve general soil health, water holding capacity and make soils more resistant to drought. Although there is no data yet on the effects of practice changes for this project, one study documents 41 sustainable land management interventions and nearly all of them demonstrate significant yield increase, with 24 interventions showing a yield increase greater than 100% (Pender, 2008). Another study reviewed 45 sustainable land management interventions in Sub-Saharan Africa and found that cereal yields increased between 50% and 100% in almost all of the cases (Pretty, 2006). Almost all of these land use practices also showed significant profitability for farmers.

In addition to crop yield improvements, the project can bring other benefits to farmers.
More trees on farmers could improve the sale of tree products and reduce the cost of buying firewood off-farm. Composting and conservation tillage systems may reduce farmer dependence on fertilizers and pesticides. Project participation may also improve farmers' agricultural knowledge and skills. Finally, there are the social benefits of participating in the project including the potential for improved community cohesion, community organization strength, and potentially new opportunities for women and youth, particularly in the development of tree nurseries. It is difficult to know all the impacts that the project has on farmers because systems and are not in place for farmers to report them all. But, ultimately farmers' continued participation in the project will be an indication that they find it beneficial.

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Interviewees

Name	Position/title	Organization
Amos Wafula Wekesa	Environment &CC advisor	Vi Agroforestry
Eliud Ndole	Zonal coordinator, Malikisi	Vi Agroforestry
Japhrice Chepkemei	Field officer	Vi Agroforestry
David Muliro	farmer leader	KMT
Augustine N. Sakiti	farmer, SMC	Ngoli
Ignatius Nalyawya	Siboti Ward	Malakisi town council
Shaff Fiemba	Chief	Kimieti
Enock S. Mati	Environment/Climate Change	Vi Agroforestry, Kitale
Birusa Cassmir	field staff	Syngenta East Africa Ltd
Wycliffe M. Wekesa		Ministry of Agriculture
Pius Wamalwa	Accountant	KACE
Gernaine Simiyu	Farmer	Bumula
William Nakokha	Seed officer	Vi Agroforestry
Wachiye Emmanuel	Climate Change M&E coordinator	Vi Agroforestry
Dunean Osale	Environmental Officer	NEMA
Martin Barasa,	Zone coordinator	Vi Agroforestry
Bramwel Soita	Field officer	Vi Agroforestry
Irene Nabukanda	Field officer	Vi Agroforestry
Titus W. Murandafuh	Administrator	ICFEM
Pius Oucho	Chaplain	
Mukusi B. Emmanuel	Coordinator	REFSO
Mutambo MM	District Environmenal Officer	Bumula
Gilbert Naderia	District Forestry Officer,	KFS, Bumula
Paul Wiwasike	District Livestock Officer	Bumula
Rosemary Oyamo	Field extension officer	Vi Agroforestry
Jura JR	District Environmental Officer	Ministry of agriculture
Lordvicus J. Okwach	Field micro finance officer	Vi Agroforestry
Phillip Oketch	Veterinary officer	Ministry of livestock
Elizabeth Moi	Community Dev. Associate	Ministry of gender, children and social dev.
Janet Amalo Opondo	Organizing secretary	WIFAP
Nalwelwo O. Alaso		KFS
Charles O. Olocho	Divisional Livestock ext. officer	Ministry of Livestock
Samuel O. Odembo	Assistant chief	Provincial Administration
Joshua Onyango	Secretary	Wagai integrated farming program
Ernest Okowa Oduol	Chairman	Wagai integrated farming program
Amos wekeja	Environment &CC advisor	Vi Agroforestry
Beatrice Ocheng	Field extension officer	Vi Agroforestry
Meizedeck M. Avimba	Zonal coordinator, Wagai	SCC Vi Agroforestry

Ngoli CBO

Name	CIG	position
Michael Muhana	adult education	tree management
Charles R. wachana	yaya group	chairman
Agustine Sakiti	adult education	coordinator
Tobias wafula	ngoli CBO	chairman
Benjamin	masilea	
Sylvester Wekesa	end time	secretary
Judith Wanjala	end time	member
Irene Naswa	end time	member
Christine Wepukhudu	end time	member
Mildred Situna	wajane	member
Cesyline Makokha	adult education	member
Agnes Fwamba	end time	member
Janetrix Nabwile	adult education	member
Celana Nanjala	wachane	member
Cirila Naswa	wachane	member
Carolyne simiyu	adult education	member
Marcyline Nekesa	adult education	member
Josephine Nekesa	adult education	member
Caro Wanjala	end time	member
Sarah Wanguda	adult education	member
Lydiah Nanjala	adult education	member
Centren Mukhebi	adult education	member
Mary Masika	adult education	member
Janepher Nanjalo	adult education	member
Terwotila Nasibwoni	adult education	member
Christine Namalwa	adult education	member
Roselyne wanyonyi	end time	member
Electina N. Simuyu	adult education	member
Eunice Nangami	adult education	member
Conesmus W. wangunda	end time	member
John M. Nyongesa	end time	member
Rapheal wafula	end time	member
Amos wabwile	end time	
Mourice Masika Changalwa	adult education	chairman