



## **Case Study:** **Capturing New Market Opportunities for Farmers in the Kikuyu Forest Escarpment of Kenya**

**Organization:** KENVO (Kijabe Environmental Volunteers)

**Country:** Kenya

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## Introduction

Sandwiched between wildlife parks rife with internationally awe-inspiring animals, and the Great Rift Valley where some of the oldest human remains have been found, the agricultural landscapes of central Kenya's Kikuyu Forest Escarpment require a subtler eye to appreciate. It is not a story of another Lucy, nor of ostriches and zebras, but it may be the story that links those two, touching as it does on the necessary overlaps of human culture and the survival of biodiversity.

Studded with a mix of trees and farmed fields, the rolling hills of Kijabe ride the steep west-facing escarpment of the Great Rift Valley. The climate here, so close to the equator, is largely determined by altitude, with the rift walls molding the landscape into two comparatively level agro-ecological zones: the lower highlands, beginning 1760m above sea level, and the upper highlands, a full 900 m higher. It is the altitude that impacts the bimodal rainfall patterns and that has extensively shaped the agricultural activities in the district (Mwangi and Matua 2xxx); the semi-arid lower zone averages 700mm while the very wet upper zone receives twice that, reliably concentrated in March, April, and May, and again in October and November.

To the east, the slopes continue to rise all the way to Mount Kerita, across the border in Nyandura District. Further east still, well out of site, but both close enough and large enough to exert a tremendous gravitational pull on the landscape, Kenya's capital city of Nairobi, population 3 million, pressures Kijabe's people, forests, water, and markets, whispering 'change', all night, whispering 'more', every day.

The Kikuyu Escarpment Forests capture and filter rainwater, creating an uphill 'sponge' that feeds the many rivers and springs that provide water to the local population (Kuria et al., 1997). The region also supplies a third of the water for domestic use in Nairobi (Akotsi et al. 2006, Kuria and Githiru 2007) as well as serving as a primary source of forest products such as medicinal plants, fuel-wood, charcoal, timber, building and fencing poles, fiber, and wild fruits. Local residents use the forests for grazing land, and return there regularly to important cultural sites. Tourism in the forest generates income for both the local and national economies.

Most of Kijabe's forests are indigenous, with a small section of exotic trees planted for timber production. The forest hosts a variety of globally important species, including 20 deemed rare, and is particularly rich in bird life. It provides habitat for the globally threatened Abbott's Starling and other regionally threatened species such as the African Green Ibis, Ayre's Hawk Eagle, Crowned Hawk Eagle and the Red-Chested Owlet (Bennun, L. and Njoroge 1999).

Nearly 90% of the population in Kijabe is engaged in cultivation, laboring in the fields to feed their families, and harvesting tea and other agricultural products for markets in town, to feed Nairobi's growing population. The majority of these farms are small scale (0.8 ha, or 2 acres), with each farmer growing a diverse combination of cash and subsistence crops and keeping livestock.



Soils here are historically very deep, well drained, and dark reddish brown in appearance, with many strongly calcareous and saline pockets. The high organic carbon content (3-4%) reflects high levels of applied organic matter and low nitrogen, though phosphorus levels remain average (Makokha and Kimani 2xxx). Farmers in the area use both organic matter and inorganic fertilisers to increase soil fertility.

Along the Kikuyu Escarpment, few farms are self-sufficient enough to meet household needs and still leave a surplus from which to generate income. Questing after this goal, farms are heavily cultivated, a practice that diminishes soil fertility and soil stability; many farms along the escarpment are highly eroded. Farmers become dependent on inorganic fertilizers to combat the falling crop yields.

The majority of the peri-forest communities of this area are economically unstable. This has a direct impact on the forest because some of the residents diversify their incomes by undertaking unsustainable activities such as timber harvesting and charcoal burning, often encroaching into rainwater catchment sites. While poverty will induce people to make more extreme choices for short term survival, ignorance of the value of the forest's resources also contributes to poor long-term decision-making capacities; combined, these factors constitutes a critical conservation problem for the landscape.

The challenges of regenerating the environmental wealth of the landscape are intricately knit with the challenges of sustaining long-term economic health for the area's agricultural sector. The challenges to secure agricultural livelihoods can be clustered into those surrounding production, those centered on distribution, and those rooted in institutions of one sort or another. Production issues range from a lack of on-farm fodder and fuelwood sources, to the need for backup irrigation systems when rains are delayed, to the capacity to protect crops from birds and other opportunistic wildlife. Distribution issues can range from the lack of all-weather roads hindering the transport of harvests to markets, to the need for storage facilities to allow the farmers to stage their release of crops to the market in times of surplus. Institutional challenges include the need for established and trusted multi-stakeholder cooperative decision-making forums, a desire for accessible credit facilities in the region, and capacity building and education for individual farmers and farmers' collectives.

### **The Innovator: Who is KENVO?**

Conceived of in 1992, Kijabe Environmental Volunteers (KENVO) is a non-profit community-based organization (CBO) formed by Kijabe citizens living adjacent to the globally important Kikuyu Escarpment forests. KENVO formed after locals realized that the entire surrounding environment was being degraded through destructive habits within the forest. Two of the founding members were students at the local universities and learning about natural resources. They hatched the idea of a young adults group in the form of a 'think-tank', which would address environmental issues as a core, to raise community awareness on the value and importance of the local forests and other natural resources through environmental education and awareness campaign. They also would tie in other wider social issues affecting young people in Kijabe.



From this ambitious early mandate KENVO became engaged in a number of practical activities, including:

- Environmental education through school outreach programs
- Advocacy and awareness creation
- Forest rehabilitation
- Forest monitoring and policing
- Biodiversity related research
- Community livelihood improvement initiatives like beekeeping, ecotourism and ecoagriculture landscape management
- Youth empowerment.

Through the Ecoagriculture Initiative in the landscape, KENVO has facilitated the collaboration of the stakeholders to work as a team addressing the various issues affecting the Kijabe landscape. Of the threats and challenges described here, KENVO has directed their focus on three key issues: market development, diversification and intensification of farming systems in the area, and supporting the development of native tree based agro-forestry practices.

### **Diversification: Peter Njugnua**

Peter Njugnua used to harvest forest products to feed his family, but in years when the rains came late his children suffered from malnutrition and getting back on his feet to plant for the next season was never easy. Now Peter is a fish farmer, harvesting from his own backyard. His small pond collects clean water from the forest, but does not otherwise require the physical commitment of the forest; his family is not only eating well, but he is able to save for their education and future. Peter is not the only person in Kijabe who has begun diversifying both farming and other income generating activities. Driven by twin desires to conserve the forest and stabilize their own livelihoods, those of Peter's neighbors who are able to procure the funds have begun to implement viable, profitable projects they believe will change the outlook of their future. To make these projects feasible, markets need to be developed for the new ecofriendly products. Well situated to tackle this challenge, KENVO is rapidly learning the necessity of jointly addressing economic and ecologic aspects of a scenario, and the complexity of this work.

Local food processing industries and proximity to a ready market in Nairobi has increased the demand for livestock products. The Division therefore has witnessed a rise in livestock production, notably dairy cattle, poultry, sheep rearing, dairy goats, and pig keeping, in that order. Dairy production, mostly zero grazing, is practiced due to the small land holding per household. Fish farming is also emerging as a fast growing commercial enterprise, but productivity is still low. A few farmers also practice apiculture (beekeeping), although its potential has not been fully realized owing to lack of information and the inaccessibility of capital intensive modern beehives.



KENVO is working in collaboration with the majority of the stakeholders to foster a holistic approach to address the various problems in the landscape. These stakeholders include the Community Forest Associations, Kenya Forest Service, Kenya Wildlife Service, Nature Kenya, Kenya Forest Working Group, Forest Action Network, Kenya Forestry Research Institute, Ministry of Agriculture, Ministry of Livestock and Fisheries, National Museums of Kenya, Carbacid Company Ltd, and local farmers.

In the forest sector, engagement is growing in participatory forest management activities in which multiple stakeholders convene to address the various threats facing the forest. In the agricultural sector, a farmer's forum has been formed under the National Agriculture and Livestock Extension Programme (NALEP). NALEP is a multi-stakeholders approach used by the Ministries of Agriculture and Livestock and Fisheries development. It brings key players in the agricultural sector together to address the common problems that they are facing while drawing synergy among the members. The NALEP approach is currently only operational in some areas within the landscape as it is a new initiative by the Kenyan Government.

### **Linking Consumers and Producers**



Connections between the producer and consumer depend on the nature of the products and their market chains. In Kijabe, the farm products follow different market chains. Leah Mwangi depicts the market chain for 'most' horticultural products in the landscape, in Figure 1 (pg 11, following References). There is no alliance between the producer and the consumer apart from the few farmers who have connected with



hotels or institutions in Nairobi. Some of these farmers also purchase from other growers if they do not themselves have the capacity to produce the required quantity. Most farmers supplying Nairobi businesses sell chicken, eggs, vegetables, kales, spinach, carrots, and coriander.

For products like pyrethrum and tea the market chain is different because their products need processing. These commodities are marketed through the agencies such as the Pyrethrum Board of Kenya and the Kenya Tea Development Authority, each established by the government to be responsible for processing and marketing the produce. In these cases, the marketing agency collects the products from the farmers and the farmers are paid at the end of the month; they may also receive a bonus at the end of the year. Service delivery to the farmers can be poor, and the delay in paying the farmers for the delivered products has been cited as a leading factor in the 1990s collapse of previously vibrant pyrethrum production. Other products did not fetch as high a price as pyrethrum, and as farmers scrambled for another market crop, they instigated a flood of horticultural products on to the market; this in turn led to low prices and wastage.

Due to the recent liberalization in the tea sector, private tea factories have arisen and some of the farmers who belong to the KTDA factories are now selling their tea leaves to the private company through the hawking method where the farmer is paid cash on delivery. Although this method provides an alternative market to the farmers, fears exist of impending exploitation of the farmers by the middle men, akin to the farmer experience of the dairy and pyrethrum sectors. In addition, poor quality of tea from private sector industries can affect the whole industry across the country (information gathered from farmers).

Most of the producers in the horticultural sector are not organized; each grows their own products and each approaches the market as an individual. For milk, there are farmers who are organized into cooperative dairy societies and they market and access other services like artificial insemination, animal feeds, and treatment through their society; however the prices offered by most cooperatives are too low compared to the market price, discouraging the farmers who then opt to sell the milk to the middle men.

### **Marketing problems**

The vibrant horticultural and dairy production in the landscape targets Nairobi as the main market due to its proximity. The local market, consisting of rural townships, also consumes a substantial amount of the product. Most farmers are unable to access the main Nairobi, instead selling their produce to middlemen who deliver to Nairobi. This leads to exploitation and low prices for the hard earned farm products. For example, a farmer who is able to deliver her products to the famous Gikomba and Marigiti Market in Nairobi can earn Ksh.2000 from one sale compared to the one who sells to the middlemen and earn as little as KSh. 500 for the same amount as the one who went to Gikomba. This has discouraged many farmers who are spending a lot of money for the farm inputs whose prices are always on the rise.



The problem of marketing is further aggravated by lack of market information and marketing groups, which would enable the farmers to have bargaining power. There is also lack of storage facilities for the horticultural products especially when the supply is high so as to control prices. Furthermore, there is no value addition for most products including milk, another contributor to low prices.

Kereita Dairy cooperative is the main outlet for 58.1% of milk, with a few farmers opting for middlemen who take up 32.3% of the milk market share. The cooperative sells the milk to dairy processing industries such as the Lari Dairy Alliance, Limuru Dairies, Brookside Dairy factory and Githunguri Dairies for processing to various dairy products. The middlemen deliver their milk to the city residents where there is a booming milk hawking business. Income from milk sale ranges between kshs.2000 and 20,000 per month, however there is a general dissatisfaction with the performance of Kereita Dairy even for those who have been members for a long time owing to low payments (KENVO Survey 2007).

Despite the presence of these markets, attendance is very poor because of the common products on offer from the farms. The Soko Mjinga and Kirenga markets attract traders from Nairobi and the products are traded in bulk. More than 60% of the traders come from Nairobi and they market the products both in Nairobi and Mombasa.

Tea and pyrethrum, which are the main cash crops in the landscape, are marketed through the Kenya Tea Development Agency and the Pyrethrum Board of Kenya respectively for processing. Payments are made on monthly basis especially for tea but for pyrethrum it is paid periodically. This has resulted in many farmers doing away with the pyrethrum, which used to be the gold for Lari Division in the 1990s when it fetched good prices and the Board was well managed. During those years Lari was a leading producer of Pyrethrum and most of the farmers had joined together to form the Kereita Dairy and pyrethrum Cooperative Society. The society invested in fixed assets on behalf of the farmers and it today owns the Kiambu Unity Finance that provides banking services to the farmers and others within Kiambu District.

Currently the difficult economic and social situation in the Province makes urgent the need for finding practical solutions to increase productivity and decrease negative impacts on existing resources. Local farmers are willing to try new alternatives for ecosystem restoration, some of which may include agroforestry combinations with the most common cash crops. In order to suggest productive alternatives for the recovery of degraded soils, KENVO has implemented a native tree species seedling and reforestation project. Using native species helps promote productivity and adaptability to degraded sites without having to acquire means from alternative or outside sources. This work has also promoted them to look at other diversification and intensification schemes to ease the pressures on local natural capital. Activities such as bee keeping and fish farming are becoming popular in the area with the help of the volunteers. There are many other options for increasing the scope of new projects, however KENVO currently lacks sufficient resources to pursue all of them.



## Water

The surface and sub-surface water resources in the Division are abundant, within the higher reaches of the landscape. There are a number of permanent rivers and springs. A substantial percentage of the households also collect rain water through roof catchment. Underground water resources are tapped with well and boreholes; these are reliable with high yields and good potential for irrigation with the proper mechanization. More than three-quarters of the households in the division have access to safe water sources within a distance of 2.3 kms (Mwangi and Matua, 2007).

In the lower reaches of the Kikuyu Forest Escarpment, water is not so plentiful. In this lower potential agroecological zone, less well-to-do farmers labor to create ponds of sufficient water holding capacity to provide year-round supplies for their homesteads and livestock. As more of these rain and surface water traps spring up throughout the landscape, KENVO is concerned about the consequences for soil erosion and potential gulying, of footpaths for livestock and people leading to and from them. Before this problem accelerates, KENVO hopes to mobilize the social capital that is evident from the construction and shared use of these water resources, to develop management and monitoring plans for the footpaths.



## Conclusion and questions

Leah Mwangi, David Kuria and their colleagues in KENVO need help in thinking through how to develop value chains for the agricultural products that farmers produce in the Kikuyu Forest Escarpment landscape, that can help conserve the ecological values of





the region. They have heard about eco-certified products and are familiar with success stories about their development in other places; the “Its Wild” brand in Zambia, for example, created through the Wildlife Conservation Society’s COMACO project.

Leadership of KENVO is aware, also, of possibilities for linking eco-tourism with eco-certified products to capture additional value for producers and their communities. They have been advised by many to pursue this approach by taking advantage of the famous and breath-taking views into the Great Rift Valley from a national highway that runs through their landscape, and the various viewpoints that the highway affords. They have heard of the concept of agro-tourism, and agro-eco-tourism, and expect there is potential for developing such an industry in their landscape, and wonder how they might go about it?

Furthermore, David and Leah recently have begun to wonder if there might be potential for the Kijabe region to capture ecosystem service values for the watershed conservation role that the landscape plays for Nairobi. Might groundwork be laid for a Payments for Ecosystem Service (PES) scheme, that would eventually compensate people living in the landscape for practicing agriculture and managing forests in ways that would help ensure a reliable water supply for Nairobi? What measures would they need to take to be able to participate in such a scheme, and to help create it?

And finally, they wondered, if any of these three approaches to eco-certification had merit -- product certification and branding, eco-agro-tourism, and/or a PES scheme – might there be merit in pursuing the creation of a ‘landscape label’? They had been introduced to the concept, recently, at a conference. The idea was to capture multiple ecosystem values that farmers and other residents of a complex landscape helped to conserve and deliver through their land use practices, including clean and reliable water, wildlife habit, carbon sequestration and livelihood security for local people. Could KENVO’s commitment to pursuing an ‘ecoagriculture’ approach to landscape management possibly lead to the development of a landscape label? Would an ‘eco-label’ require certification? What would they need to know, and to convey to others, to interest potential partners in pursuing the development of a business plan for a landscape label for Kijabe Division, and the Kikuyu Forest Escarpment? And what kinds of partnerships should they pursue?

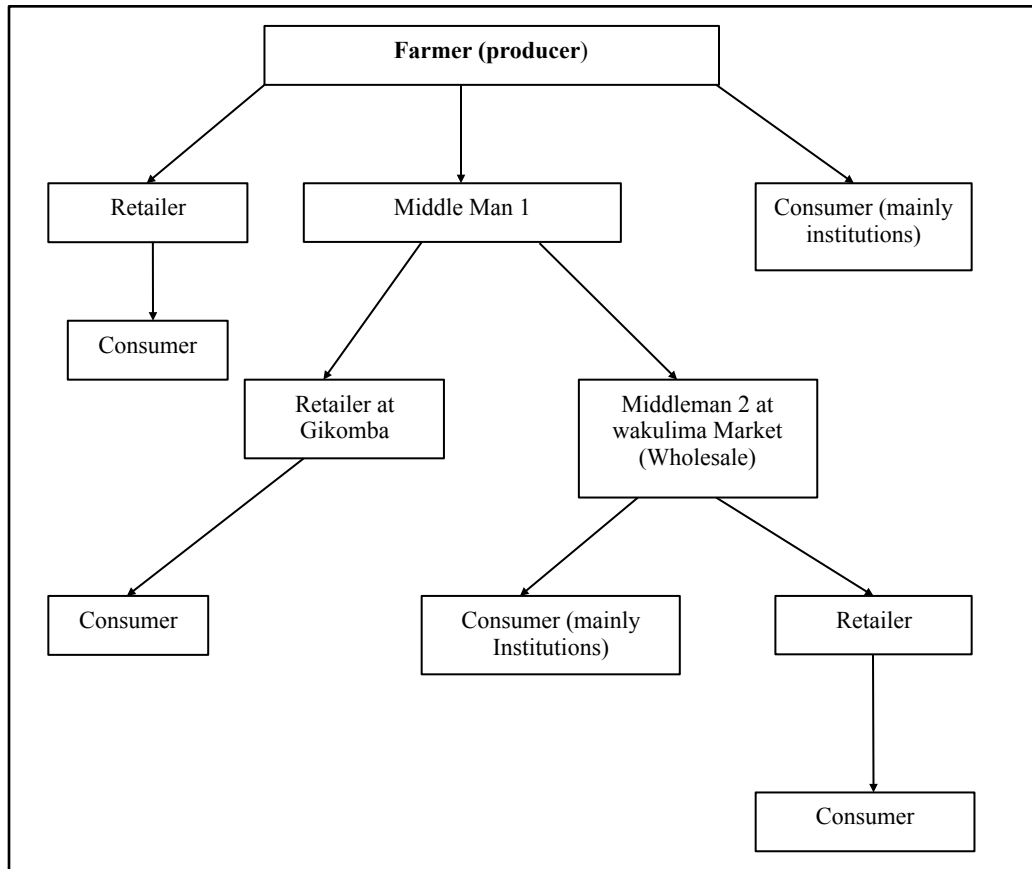


## References

- Akotsi et al. 2006. As cited in, Background: Kikuyu Escarpment Forest. KENVO website. <http://tdesigns.free.fr/kenvo/background.html> Retrieved March 2010.
- Amede, T., Kirkby, R., & Stroud, A. (2004). Intensification Pathways from Farmer Strategies to Sustainable Livelihoods. *Integrated Natural Resource Management in Practice: Enabling Communities to Improve Mountain Livelihoods and Landscapes*. African Highlands Initiative. p. 85-97
- Bennun, L. and Njoroge, P. (1999). *Important bird areas in Kenya*. Birdlife International.
- Kenya National Coordinating Agency for Population and Development. (2005). *Kiambu district strategic plan 2005-2010 for the implementation of the national population policy for sustainable development*.
- Kuria et al. 1997. As cited in, Background: Kikuyu Escarpment Forest. KENVO website. <http://tdesigns.free.fr/kenvo/background.html> Retrieved March 2010.
- Kuria and Githiru. 2007. As cited in Mwangi, Leah W. 2009. A case study on Ecoagriculture activities within Kijabe Landscape of Lari Division in Kiambu West: Based on work by Kijabe Environment Volunteers. KENVO, Kenya and Ecoagriculture Partners, Washington, DC. [http://www.ecoagriculture.org/publication\\_details.php?publicationID=308](http://www.ecoagriculture.org/publication_details.php?publicationID=308)
- Makokha, S & Kimani, S. (2001). *Determinants of fertilizer and manure use for maize production in Kiambu district, Kenya*. Mexico, D.F: International Maize and Wheat Improvement Center (QMMYT) and Kenya Agricultural Research
- Makokha, S & Kimani, S. (2001). *Determinants of fertilizer and manure use for maize production in Kiambu district, Kenya*. Mexico, D.F: International Maize and Wheat Improvement Center (QMMYT) and Kenya Agricultural Research Institute (KARI).
- Millard, E. (2007) Restructuring the Supply Chain. from *Farming with Nature: The Science and Practice of Ecoagriculture* (McNeely & Scherr) p. 358-379
- Montagnini, F. Eibl, B., & Fernandez, R. (2005) *Agroforestry Systems with Native Tree Species in Misiones, Argentina: Productive, Social, and Environmental Services*. AFTA Conference Proceedings.
- Mwangi J.N. and Mutua J.M. As cited in Mwangi, Leah W. 2009. A case study on Ecoagriculture activities within Kijabe Landscape of Lari Division in Kiambu West: Based on work by Kijabe Environment Volunteers. KENVO, Kenya and Ecoagriculture Partners, Washington, DC. [http://www.ecoagriculture.org/publication\\_details.php?publicationID=308](http://www.ecoagriculture.org/publication_details.php?publicationID=308)



**Figure 1.** Market Chain for most Horticultural Products developed from information gathered from the farmers. Mwangi, L.W.





## Appendix A. Tables & Figures

**Table 1:** Mean monthly rainfall in Lari recorded at Kereita Forest station (2438m a.s.l.) and Matathia Railway Station (2288m a.s.l.)

Station	No. Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Kereita	45	80	68	116	318	226	70	49	61	45	105	164	93
Matathia	24	55	50	96	314	253	44	20	39	28	67	164	91

Source: Mwangi J.N and Mutua J.M.

**Table 2:** Main farm activities across the year in one part of the Kijabe Eco-agricultural landscape

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Harvesting	x	x										
Preparation		x	x					x	x			
Planting				x	x	x				x	x	
Spraying				x	x	x	x	x		x	x	
Weeding					x	x	x	x	x		x	x

Source: Division Agriculture officer-Lari.

**Table 3:** Education Institutions across the Kijabe Eco-agricultural landscape

Type of Institution	No. of institutions	Remarks
Secondary Schools	29	4 private
Primary Schools	57	15 private
Village Polytechnics	3	1 operational
Adult Classes	17	Enrolment in 2007-410
Non-formal Classes	5	Youths who dropped out of schools
Nursing School	1	Church based
Bible College	1	Church based

Source: Education Officer Lari

**Table 4:** Markets within or in the areas neighbouring the Eco-agricultural landscape

Name of Market	Place situated	Type	Market Days
Kimende	Kijabe Location	Open Air	Mondays and Thursdays
Kamburu	Kamburu location	Open Air	Tuesdays and Fridays
Kagwe	Nyanduma/Gatamaiyu locations	Open Air	Wednesdays and Fridays
Kirenga	Kirenga Location	Open Air	Tuesdays and Fridays



Nyambari	Lari and Gitithia Locations	Open Air	Daily
Soko Mjinga	Kinale and Kamae Locations	Open Air	Daily

Source: MOA-Lari Division

**Table 5. Main Stakeholders in the Landscape and their Roles**

Stakeholder	Role
Kenya Forest Service	Management of the Forest
Kenya Wildlife Service	Management of wildlife within the landscape
Community Forest Associations	Utilization, management and conservation of the forest.
Kiambu Unity Finance	Banking services
Kereita Dairy	Marketing of milk and improvement of dairy farming
Lari Dairy Alliance	Milk processing and value addition
Farmers SACCO	Promoting the interest of the farmers and improving their productivity
Carbacid Company	Mining of carbon dioxide from the forest
Nyayo Tea Zone Development	State corporation that grows tea along the forest boundaries
Ministry of Agriculture	Technical support in Crop production, policy formulation and enforcement
Ministry of Livestock and Fisheries development	Livestock production
Upland bacon factory	Used to process pig products, but it is currently a private property
Farmer's Choice	Provides market for Pig and Poultry, also offer training to farmers rearing pig
Kenya Dairy Goats association	Promotion of dairy goat farming, Training and breeding
Kenya Forest Working Group (KFWG)	Capacity building and advocacy to local communities to participate in Forest management
Kenya Network for Dissemination of Agricultural technology (KENDAT)	Project in promotion of efficient transport for farm products through use of draught animals, hence promotes donkey welfare.
Forest Action Network(FAN)	Lobbying and advocacy for community involvement in forest management and livelihood improvement
Nature Kenya	Conservation of critical biodiversity areas such as the Kikuyu Escarpment Forest.
Kenya Forest research Institute (KEFRI)	Research and seed production, also offer trainings in forest conservation
Kenya Tea Development Agency	Marketing of tea
Pyrethrum Board of Kenya	Processing and marketing of pyrethrum
Ministry of Roads and Public works	Maintenance of roads
Local Authority	Maintenance of the markets and issuing of business permits and licenses
Africa Now	Marketing of flowers
Nature Grown Ltd	Marketing of flowers



National Museums of Kenya	Research / ornithology
Tea factories	Collection and processing of Tea
Kenya Tea Development Agency	Production and marketing of tea.
Pyrethrum Board of Kenya	Processing and Marketing of Pyrethrum
Horticultural Crop Development Authority (HCDA)	Promotion of horticultural practices and storage facilities for exporters.
Farm Concern	Promotion of organic farming and marketing of organic products
Farmers Choice	Processor of Pig products.
Kereita Pyrethrum Co. Ltd	Production of pyrethrum and provision of planting materials.

## Appendix B. Maps

### *KENVO Eco-agricultural landscape*

