

Exploiting indigenous knowledge in the environmental conservation and promotion of african plants: case study on Mwingi and Kyuso districts, Kenya.¹

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Introduction

Mwingi and Kyuso districts are located in the semi-arid zone V region of Kenya with annual rainfall of less than 400 mm. The biggest town of the districts is Mwingi town and it is located about 170km east of Kenya's capital city Nairobi. The two districts are agro-climatically placed into arid and semiarid zones (ASALs) and they take up 33.6 million hectares of the country's 44.6 million hectares of arable land with substantial areas, apart from the two districts, being in Machakos, Makueni, Kitui and Kajiado districts (Gachimbi et al., 2001). It is a region that has traditionally supported low populations of the Kamba people who were hunters that at the same time practiced an extremely low intensity form of agriculture and reared livestock (especially goats). Over several years, they developed sustainable and effective exploitation mechanisms of the existing biodiversity resources to satisfy their individual needs and those of their societies in general.

According to Goodin and Northington (1985), ASALs, due to their heterogeneity, have produced a wide variety of plants with diverse forms and chemistries as well as capabilities for efficient utilization of water. They thus represent a high economic potential. However, over the past few decades, Kenya's population growth rate has been increasing and due to scarcity of land, there has been an emigration of the largely rural population from the high agricultural potential to low agricultural potential regions. This, in turn, has led to greater cultivation to meet food demands (locally and in nearby urban centres), the unsustainable harvesting of trees for firewood, timber and other non-timber products, increased use of pharmaceutical drugs hence loss of traditional knowledge on and value of medicinal plants.

Environmental impacts include reduced water quality and availability as well as land degradation. Social impacts on the other hand include a further impoverishment of the people from reduced resource options and an inability to benefit directly from the knowledge of medicines long held in their communities.

Rationale

There is no gainsaying the great importance of planting and conserving our trees in Kenya. In Central province, for instance, rivers have dried up over years as a result of massive deforestation to create land for settlement and cultivation. The environmental disaster in Central Kenya can be replicated in most parts of the country, including Mwingi. In this particular area, water is a scarce resource and this shortage can lead to violent competition thus jeopardizing development and peace. In other words, environmental instability can be the engine for strife and war among peoples.

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² Mr. Hannington Agesa provided the photographs and videos during the research.

Residents in Mwingi obtain their water from underground and usually take long distances hence the use of lorries, bicycles, carts and donkeys as a means of transport. The water is used for all purposes i.e. human and livestock consumption, domestic use and agriculture. It is therefore important that re-forestation and conservation efforts be mobilized urgently to manage the current disastrous situation in Mwingi. Hopefully, the success in this region can be replicated in other parts of the country like Nakuru.

Aim

The project aimed at understanding the knowledge and attitudes of the local populations with regard to the local vegetation. It also sought to tap into any existing local indigenous knowledge to set future plans for conservation (e.g. through reforestation and afforestation) and income generation from medicinal substances.

Objectives

- i.) To identify valuable plants from the point of view of the locals.
- ii.) To categorize plants with medicinally active substances from indigenous knowledge
- iii.) To establish contact points for tree growing activities
- iv.) To record the current ecological situation in Mwingi and Kyuso districts

Research questions

The team formulated these in order to ensure a higher degree of objectivity in the semi-structured interviews. These were as follows:

1. Why aren't there many trees in Mwingi and surrounding areas?
2. Which trees can do well in the hostile terrain of Mwingi?
3. Would a re-forestation programme be useful in Mwingi?
4. What might threaten the viability of the re-forestation programme?
5. What vegetables do the local people consume? Why? Are they a viable venture in Mwingi?
6. What is the local attitude toward plants especially trees?

Methodology

The research team embarked on an extensive study of the Mwingi and Kyuso areas by capturing the topography and vegetation cover using a camcorder. The research was conducted in the month of September when the area was very desiccated due to scarce rainfall. Generally, the district is dry with very little rainfall in the month of October.

The methodology involved taking video and motion pictures of the topography and vegetation of the Mwingi area. Visits were made to the local schools and villages to interview the local leaders and elders on the set research questions. Dialogue was encouraged as a way of creating a viable partnership to inform the research agenda. The questions were not posed in any order to create a relaxed and congenial atmosphere. The views were then collated and synthesized.

Activities and observations

The research team undertook the following activities for the two-day research visit: -

Day 1

The research team set off to Mwingi on 14th September 2007 at 8.00 o'clock in the morning. This team included Dr. Maina Muniafu, Dr. Frederick Iraki both of SDIC-USIU, Mike Makau of Kalonzo Musyoka Foundation and Agesa as the photographer.

The team arrived at Ngomeni where they were warmly welcomed by the area Assistant Chief who was already aware of the visit. There was short introduction after which the team set out to Yatta in Kalonzo Musyokas' farm to assess the tree storage facilities available. The team later moved on to Mwingi where they traveled to Ngomeni. While there the team visited Ngomeni secondary school in the company of the Assistant chief and Chairman of the market, they were introduced to the Head teacher of the school and teachers. The team also met some staffs who were knowledgeable in medicinal plants. The main aim of visiting the school was to find out if the school would like to plant some trees especially those that are not on there compound and the kind of species they preferred. The school agreed to the idea of planting trees through its head teacher especially the Mukau (*Melia volkensii*) species.

The team later addressed the whole students' body encouraging them to work hard and respect the natural environment.

Day 2

During the second day of visit to Mwingi, the team visited three areas i.e. Kyuso town, Joshua Kitindos' farm and Tseikuru secondary school all in Kyuso district. In Kyuso town the team met Joshua Kitindo who is a businessman as well as a farmer. We found out that a lot of activities carried out in Kyuso town included mainly business where locals sell their products in an open-air market. Some of the products sold included clothes, cattle and vegetables etc. The team proceeded to Kyuso secondary school led by Joshua where we met the teacher on duty who was already aware of the tree-planting mission we had and she gladly welcomed our initiative. The preferred tree species at the school was the Ikengeta (*Cassia siamea*).

The team moved on to Joshua's' farm where he has germinated Mukau (*Melia volkensii*) trees and he expressed willingness for his farm to be used in a Mukau restoration initiative. The mukau is mainly used for timber and is very resistant to ants and termites. It is not too demanding on water and grows quickly in 3-4 years. The locals stated that the mukau was difficult to plant since the seedlings were very rare. The seed has a tough outer cover that takes eons to rot away to allow for germination.

This explains why the tree, though desirable, is not prevalent in the Mwingi area. While there the team also collected some seeds for demonstration purposes at the USIU garden. (See Implementation report at the end). The seeds collected include Mkwaju, Mukau, and Muratina fruit.

The team then left to Tseikuru secondary school where the Deputy Head teacher, an environmentalist enthusiast, received them. They then went round the school identifying some of the tree species planted on the compound. The teacher reported that the soil on the school compound was poor and that they had only succeeded in growing Neem tree (*Azadirachta indica*). Further, the *muarubaini* tree was recommended mainly for its medicinal value. It is claimed that it can treat very many ailments in both humans and animals. The schools' efforts to grow *Cassia siamea* had failed. The team was interested in helping the school plant more tree species of their own choice.

The following is the list of other trees in the area and their uses according to the local elders. Goats and lack of water were identified as the main threats to the tree planting efforts.

Table 1. List of some important plants in Mwingi and Kyuso Districts.

Local name of tree	Scientific name	Uses
Mukau	<i>Melia volkensii</i>	Timber
Muarubaini (neem)	<i>Azadirachta indica</i>	Cures many ailments: colds, fever, etc.
Iswi	(Herbaceous plant)	Relieves coughing in goats
Muuku (hard wood)	<i>Terminalia brownii</i>	Cures coughs, timber, making beehives
Muae	<i>Zizyphus abyssinica</i>	Treat stomach problems
Mwethia	<i>Albizia gummifera</i>	Cures stomach and cuts
Gikano	(Herbaceous plant)	Treats gonorrhoea
Ndao	(Herbaceous plant)	Treat plant pests
Finger euphorbia (Eng)	<i>Euphorbia tirucalli</i>	Ash cures blindness in cows; treat chicken diseases (when mixed with Kiluma); treats gall bladder problems in humans

Kiluma (green)	Aloe Vera	Cures fever
Mua	Shrub	Cures tapeworms, heart burn, headache
Kitungati	Commiphora eminii	Cures stomach ulcers, constipation
Mwelengwa	Shrub	Treats diarrhoea when mixed with Kitungati
Katongatongu	Shrub	Treats stomach and diarrhoea when mixed with Isivu.
Itongu	Shrub	Treats stomach, eye problems in cows
Mumbaaume	Shrub (TBI)	Aphrodisiac for both men and women
Kyoo (Muu)	Markhamia lutea	Ash antidote to poison, cures constipation
Ikungu	(Herbaceous plant)	Treats scorpion bite
Muatine	Kigelia africana	Making beer (muratina)
Mulaa	Acacia tortilis	Cures colds (smoke dry root like a cigarette)
Kithumula or mkwaju	Tamarindus indica	Make sour porridge, savour vegetables
Mvingo (mpingo in Swahili)	Dalbergia melanoxylon	Timber, hardest wood.

African leafy vegetables

Local African vegetables are relatively higher in nutrition and medicinal value when compared to other vegetables like cabbage, spinach, etc. There is value in encouraging the growing and consumption of these plants among African people. In addition, these fast-growing vegetables can help in alleviating poverty in Mwingi as they are in great demand in Nairobi.

The local people explained that they only consumed sukuma wiki (kale), cabbage, spinach and *mathoroko* from the market and hardly ever contemplated growing them seriously. Upon discussion with the research team, they explained that they did not know the benefits of the African leafy vegetables, nutritional and commercial aspects. They were now willing to experiment with seedlings if engaged in the growing and maintenance process. There was also a need to provide knowledge on how the vegetables are prepared before consumption or marketing.

Way forward

The findings from the visit are important for they show a new way to creating viable programmes among local populations. The idea of discussing the tree and African vegetables programme with the local people with a view to sharing and not telling them what is desirable for the Mwingi area bore fruit. The local community was more than willing to start the project during the rainy season in November. The views expressed by the people confirm the need to create innovative projects in Mwingi to support the environment and alleviate poverty.

The greatest lesson learnt was that local knowledge should never be taken for granted. Any project should seek to share and integrate the views and expertise of local people.

The team had the following suggestions as to the way forward.

1. Propagation and growing of collected seeds at USIU demonstration gardens.
2. Intensive tree growing in the visited schools during the month of October 07 rains.
3. Establishment of tree information centres in the three schools
4. Establishment of Mukau (*Melia volkensii*) trees in Joshua's' farm for demonstration.
5. Assist the three schools with information on other subject areas of information.

Conclusions and recommendations

The study in Mwingi reveals a terrain denuded by human activity and inclement climate. The area receives scant rainfall and enjoys very little shade. From the local people, the *mukau* would be the most promising specimen to propagate in the region due to its value for hard wood and its fast-growing record.

The Mwingi people do not grow any of the African leafy vegetables due to lack of information and also cultural orientations. There is need to provide education, training and managerial skills in order to stimulate the growing, consumption and marketing of these vegetables.

The two-tier strategy (trees and vegetables) would go a long way to alleviate poverty while conserving the environment.

Most of the indigenous trees are an essential part of human existence. In Mwingi, these trees have numerous uses and services including fuel wood, timber, livestock food, medicine, soil conservation, beehives, human food etc. Some areas in Mwingi only favour growth of certain tree species while others don't. Due to this kind of pattern, efforts for locals to grow certain tree species have failed. This is evident at Tseikuru Secondary School.

There is a need to tap into, record and indeed sustain indigenous knowledge and technologies. The importance of traditional natural resource management to the sustainability of the ASAL ecosystems cannot be underscored. Although they are not necessarily perfect, the main aim should be to use such systems to build on potentials in order to solve the many and varied problems (Barrow, 1996).

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