



Biovision  
Africa  
Trust



# **BEST PRACTICES IN ORGANIC FARMING**

**Success Stories from Farmers in Kenya**

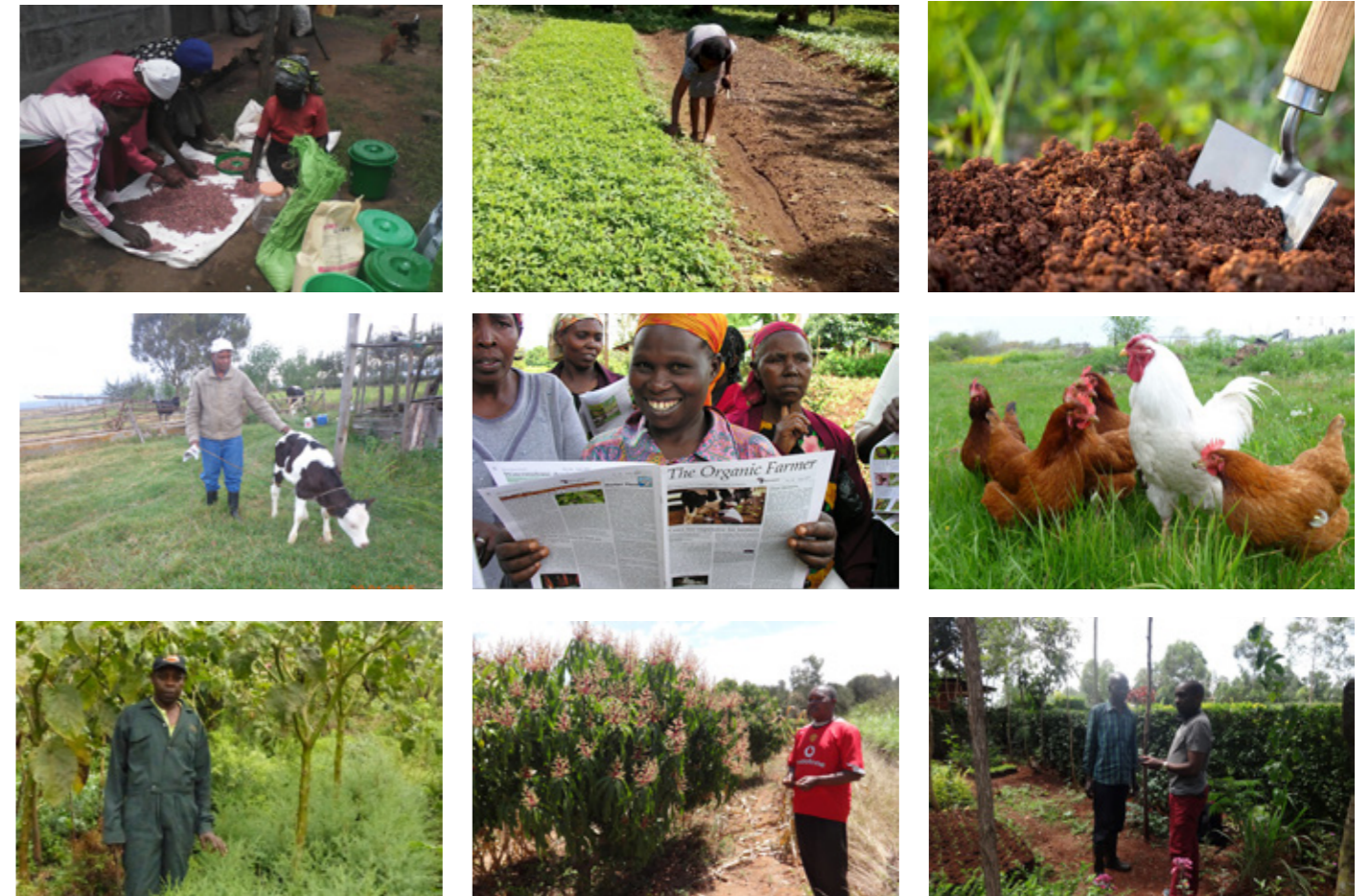
# Content

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 BEST PRACTICES IN ORGANIC FARMING: Success Stories from Farmers in Kenya

Published By



c/o ICIPE, Duduvile Kasarani, Off Thika Road,  
 P.O Box 30772 - 0100,  
 Nairobi



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# Foreword



**Dr David Amudavi**  
Executive Director

**A**frica is one of the richest continents in terms of natural resources yet it is also the continent with the highest rates of poverty. In Kenya, one third of the population is food insecure hence not having adequate food to meet their nutritional needs. Ironically, some of the poorest and vulnerable people in Kenya are farmers in the rural areas.

The aim of Biovision Africa Trust (BvAT) is to combat poverty, improve livelihoods of smallholder farmers by sharing information on ecologically sound methods that can improve food production while conserving the environment.

The publication of *BEST PRACTICES IN ORGANIC FARMING: Success stories from farmers in Kenya* was informed by the need to tell the successes of our farmers not only to celebrate them, but through these stories educate other farmers. The success stories in this publication are based on diverse "evidence-based" best practices in organic farming that are affordable and can be replicated by other farmers across all regions.

In the face of harsh weather patterns and pests, farmers face many challenges. Yet with proper training and adoption of innovative technologies, the challenges can be transformed to hope. For example, within our projects, chicken farmers in western Kenya who had initially faced challenges with New Castle disease found solutions that ensured that they increased their egg production and income from the sale of chicken. The same farmers are today an example of resilience and hope in their communities.

**Why we must tell our success stories**

Farmers are dreamers, every time a farmer plants a seed, they hope for the seed to grow to maturity. They hope that the maturity of the seeds will increase their food production, increase their income and improve the quality of life of the members of their households. Success stories are therefore stories about dreams. We should tell our stories of hope to encourage others.

Sharing success stories also provides an avenue for communicating about the innovations that come out of our research. Research is challenging and many times can fail. Therefore, it is important to celebrate when solutions from many days and investment in research and innovation work.

A majority of smallholder farmers in Kenya have no access to research knowledge that is published in academic/scientific journals. Biovision acts as the intermediary, ensuring that research information is translated to simple and practical knowledge that can be disseminated to farmers across all regions in Kenya.

When people see a farmer succeeding in terms of quality and quantity of yield, the image of success creates a lasting impression. Sharing success stories therefore shortens the learning curve and gives other farmers the courage to try successful methods because they have seen farmers from their villages and social circles succeeding.

Last but not least, familiarity breeds contempt. Sometimes farmers can ignore well-established solutions just because the solutions are familiar. Success stories from adopting such familiar cases can create awareness and fortify the knowledge about the well-established methods.

In publishing these success stories from our farmers in Kenya, we can only hope that these best practices in organic farming can be replicated by other farmers. Additionally, we hope that the solutions offered by BvAT can be a source of inspiration for partnership with other key stakeholders to ensure scaling up of these solutions. Only then can we start to move towards becoming food secure not just as a country but also in the entire Africa.

**"Your success may be the motivation that another farmer needs to move from hopelessness to profitability. Let us build each other by sharing our success stories."**

# BvAT Approach

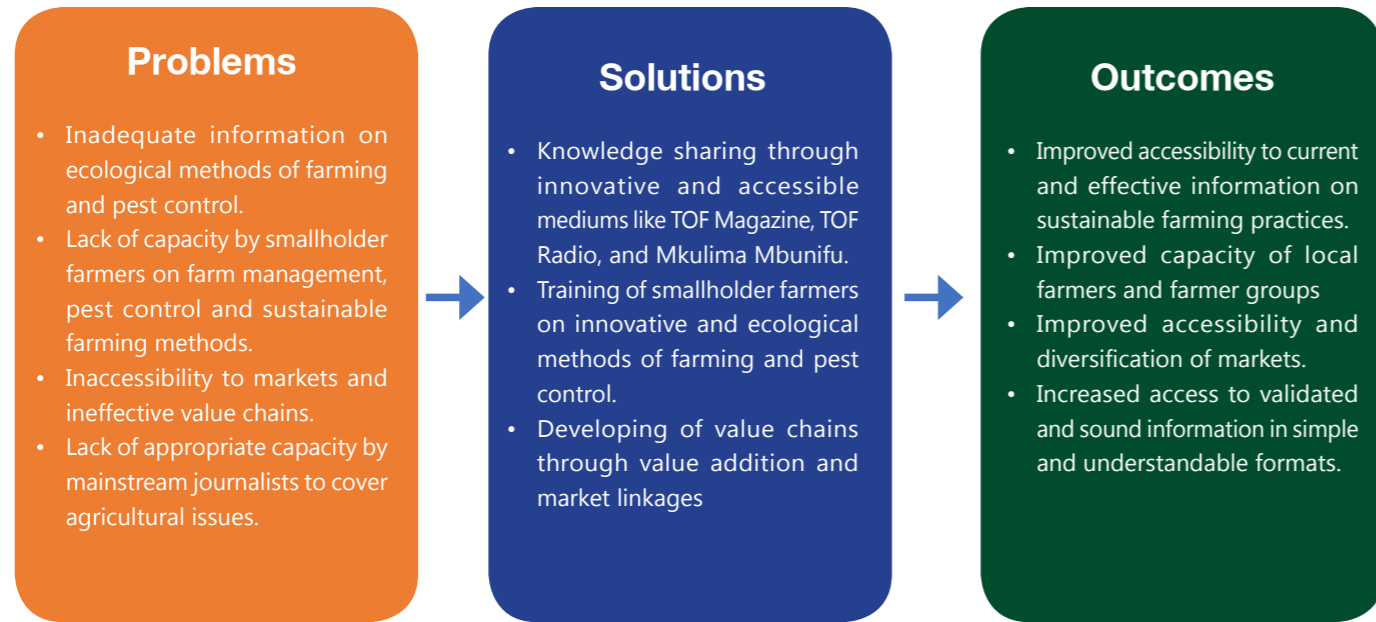
The Biovision Foundation established Biovision Africa Trust (BvAT) in Kenya as a non-profit institution in 2009. BvAT aims to alleviate poverty and improve the livelihoods of smallholder farmers in Kenya and other African countries through supporting dissemination of information and knowledge on appropriate technology to improve human, animal, plant, and environmental health.

BvAT believes strongly that it is only through sound research and effective education that it can meet its noble objectives. To promote food security, economic growth and environmental stability, BvAT is implementing the Farmer Communication Programme (FCP) which disseminates information to farmers through multiple channels and the Ecological Organic Agriculture (EOA) Initiative and the Changing Course in Global Agriculture (CCGA), which stress on research on policies that are agriculturally sound and promote practices that favour such policies.



For effective education on sustainable solutions for poverty and food security, BvAT recognizes the central role of smallholder farmers. Particularly, farmers with proper information and capacity to transform their challenges into lessons of hope and prosperity for many other farmers.

To achieve this aim, we work with smallholder farmers in Africa and with like-minded institutions to create sustainable solutions that can improve food production, diversify the income and ensure better livelihoods for the farmers. In addition, we create awareness about well-established methods that can address the food security needs of the African content.



### Our Programmes

#### Farmer Communication Programme (FCP)



#### Ecological Organic Agriculture-Initiative (EOA-I)



## Farmer Communication Programme (FCP)



The Organic Farmer (TOF) is an information service for farmers in Kenya and the wider East African region, with a focus on providing practical advice through print (a monthly farmers' magazine) and broadcast (radio programs).



TOF Radio is broadcast on KBC on Tuesday and Thursday at 7:30pm and Mbaitu FM on Friday at 8.30pm. Tune in and listen to farmer experiences and expert advice on agribusiness and eco-friendly farming methods



A free magazine provided to farmers in swahili language to provide sound agro-ecological information to farmers in Tanzania and East Africa



Activities of the FCP Outreach team include farmer group trainings, individual farm visits, exchange visits for farmers, field days and exhibitions, linkages with other service providers such as input suppliers, credit facilities and markets and assisting farmer groups register with the Department of Social Services so that they are eligible for grants and loans



Infonet, a channel of the Biovision Farmer Communication Programme (FCP), provides scientific and practical validated information and knowledge related to plant (crop), animal, human and environmental health. The resource gives farmers, trainers, students, and extension workers quick access to up-to-date and locally relevant agricultural information and related topics. Infonet-Biovision's aim is to increase human and animal welfare and health, improve regional and local food security and at the same time conserve the environment and biodiversity.

## Ecological Organic Agriculture - Initiative (EOA-I)



The goal of the project is 'to mainstream Ecological Organic Agriculture into national agricultural production systems by 2025 in order to improve agricultural productivity, food security, access to markets and sustainable development in Africa'. EOA is a holistic production management system that considers the agro-ecosystem in all its diversity. It focuses on attaining a balanced food system designed to enhance biological diversity, promotes healthy use of soils, air and water; relying on renewable resource in locally organized agricultural systems.

# Better Seed, Better Harvest: Community Seed Banking



"We realized that our livelihood was faced with a serious threat as organic farmers; Lack of Organic seeds in the market coupled with expensive commercially marketed seeds" says Elizabeth Karanja,

By Francis Maina

It may seem obvious that for crops to grow, we need to plant their seeds. But what happens when we have no seeds to plant? About 75% of farmers in Kenya are smallholder farmers whose crop production feeds Kenya's growing population.<sup>1</sup> When their crop fail, the farmers in desperation sell and/or eat all their produce leaving no seeds to plant in the next season.

The unavailability of adequate quantity and quality seeds for planting was a common challenge for farmers in Gitare, Nakuru county. The last time Kenyan farmers recorded a bumper harvest was in 2006, and in subsequent years crop yield has decreased, with the situation worsening due to frequent droughts in various parts of the country. The little harvest, coupled with the ever increasing population, led to an increased consumption of food that exceeded production.<sup>2</sup> The result was food scarcity and eventually seed scarcity.

By January 2015, the members of Mwireri (SHG) a group of farmers organised under the Biovision Farmer Communication Programme (FCP) at the Gilgil resource centre, were faced with the real danger of seed scarcity.

With support from field officers from BvAT at Gilgil resource centre, the farmers group took the initiative to establish seed-banks. The seeds are sold back to farmers through cash or as loans at the start of the planting season

### What is a seed bank?

A seed bank is much like a financial bank; seeds from various crop varieties are 'deposited' in a facility that preserves them under scientifically determined conditions for a given time period and either sells or 'loans' the seeds are sold or loaned back to farmers at the start of the planting season.

A major benefit of seed banks is in availing organic seeds that are not available in the market. The seeds of local crop varieties are conserved within the community, and can

## Benefits of Seed Banking

### Preservation of crop diversity

Crops, just as any other living organism, adapt to their environment and the prevailing climatic conditions to survive. Preservation of crop diversity is therefore one of the main reasons for storing of seeds.

### Protection from climate change

Proper storage of tolerant seeds can reduce the danger of total elimination of essential crop species as a result of climate change.

### Protection from natural disasters

Natural disasters including floods, long-drawn droughts, can have drastic impact on the quality, availability and performance of crops. Keeping seeds in a seed bank could save such a situation.

### Promote resistance to diseases

Crops are prone to diseases that can be highly contagious. Having seeds in a seed bank can provide an alternative for propagating disease-free crops.

### Provide seed material for research

Seeds that are stored in seed banks can provide samples for research and act as a basis for development of improved seeds.

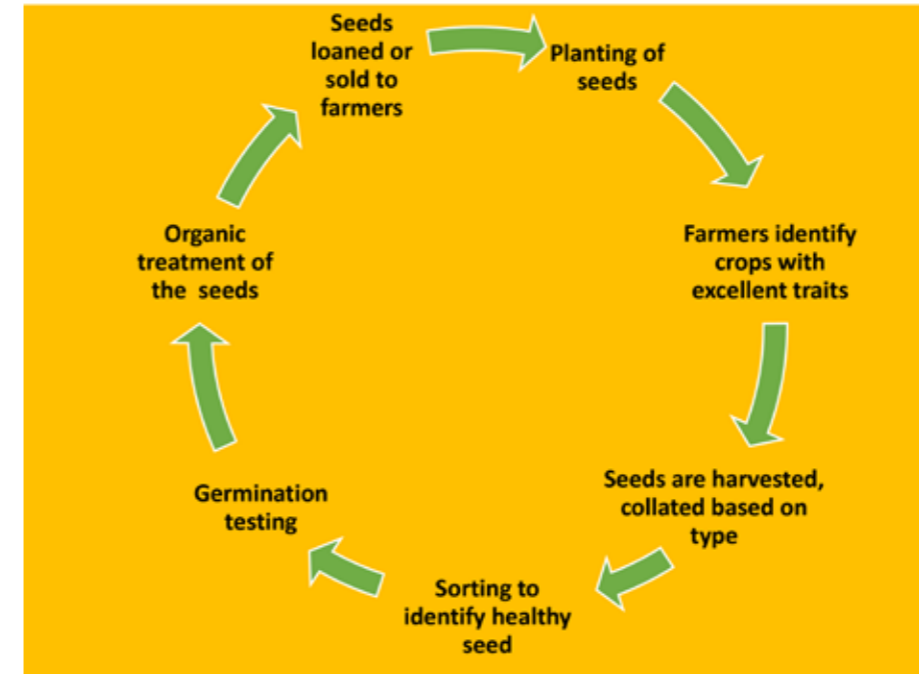
### Preservation from man-made disasters

Seed banks provide an alternative source of crop propagation in the event of man-made disasters. Properly stored seeds can remain viable for hundreds of years.

even be multiplied to make them available to more farmers and reduce the chances of extinction. Seed banks also involve farmers in the production of high quality seeds as the seeds can be developed for different traits such as early maturity or drought tolerance. Locals who establish seed banks are able to rely on the seed business to raise income for the sustainability of the gene bank.

### The Success

The Mwireri SHG farmers group established



Seed Banking Process

their first seed bank with a few traditional seeds from various crop varieties such as maize, beans, and potatoes. Field agents from Biovision trained them on seed selection, treatment, preservation, and storage. Seed selection process was based on the early observation made from the parent plant. Each farmer is trained in seed production and management to ensure that the seed received in the community seed bank is of good quality. The trainers encouraged them to harvest seeds from plants that had excellent traits such as faster germination, rapid growth, early flowering, and early maturity. The identified suitable crops were tied with coloured ribbons for easier identification and subsequent seed collection.

### Germination Testing

After collecting all the suitable seeds from the identified parent plant, the next step was seed sorting. Broken, rotten, shrivelled, and

damaged seeds were removed from the healthy ones to improve viability. The farmers then proceeded to carry out a germination test using the healthy seeds only. Ten seeds from each gunny bag of a particular variety were planted on dishes to assess the seed germination percentage/rate.

After the germination test, the viable seeds are treated organically using organic seed storage preservatives such as wood ash, diatomite powder, and firewood soot. The treated seeds are packed in gunny bags, plastic, and glass containers provided by The Seed Saver Network, the groups' principal partner, and are then stored in the community seed-bank.

Crops propagated using vegetative materials are preserved in demo plots. They include sweet potatoes, cassava, sugar cane, arrowroot, and banana. Hellen, the Mwireri farmers' group secretary says.

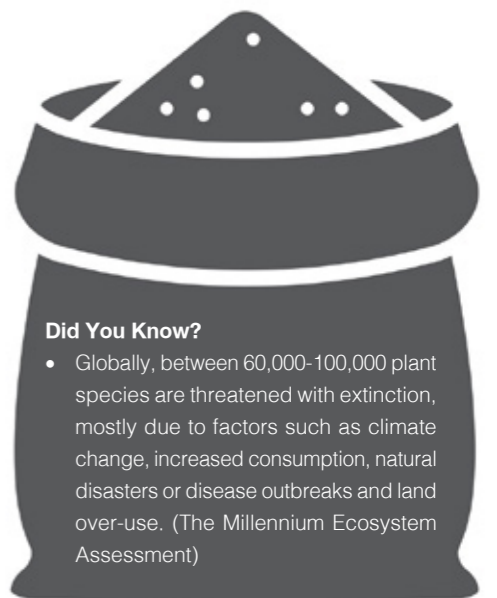
$$\text{Germination Percentage Rate} = \frac{\text{Number of seeds that germinated}}{\text{Number of seeds planted}} \times 100\%$$

To assess the actual percentage, the following formula was used;

Farmers either buy or borrow the seeds they need from the bank. For the sustainability of the seed bank, the borrowers are required to return twice the amount of seeds borrowed. Approximately 200 farmers solely depend on this bank. Farmers have also been facilitated in their efforts to diversify their crops. Courtesy of the project, the farmers are more informed on the benefits of crop diversification, chiefly to sustain the existence of many different varieties of plants and their seeds. As a result, since the farmers have access to quality seeds, their crop yield has increased leading to significant availability of food in these areas.

### Crop Diversity and Companion Farming

Similarly, the availability of seeds means farmers are guaranteed a yearly harvest, putting more money into their pockets, and has made farming more enjoyable. The availability of different variety of seeds means farmers are not limited to planting only one crop and this has reduced monocropping which is associated to greater pest infestations and low crop quality with every harvest.



### Did You Know?

- Globally, between 60,000-100,000 plant species are threatened with extinction, mostly due to factors such as climate change, increased consumption, natural disasters or disease outbreaks and land over-use. (The Millennium Ecosystem Assessment)

# Overcoming 'Mboga' Stigma – Sharing Knowledge on Indigenous Vegetable Farming



"A few years ago, I could never buy vegetables to take home to my family. It was a shame for a man like me to walk home with a bag full of vegetables!" says Mr. William, the local representative of BvATs official.

By Aurillia Manjella

In Singi division, Busia county, a lack of knowledge on the importance of including vegetables in one's diet supports the numerous negative attitudes that the locals have towards indigenous vegetables and fruits. 'Soma kwa bidii upate kazi ukule nyama' (work hard in school to get a good job and afford to eat meat) is a phrase many children have heard from their parents, who associate a diet rich in vegetables to poverty.

These attitudes are not unique to residents of Busia county Kenya, Researchers have since identified negative perceptions as a major reason why farmers have opted not to engage in indigenous vegetable

farming.<sup>1</sup> This is despite existing evidence on the relevance of indigenous leafy vegetables (ILVs) in complementing household food security. In the face of climate change, indigenous vegetables are considered a solution to diversify farm production, improve food, nutrition and income security in many countries in Africa.<sup>2</sup>

In Busia county, the negativity informing the consumption of local vegetables led to a steady decline in their demand. Health 1 A. Mayekiso, A. Taruvunga, and A. Mushunje, 'Perceptions and Determinants of Smallholder Farmers' Participation in the Production of Indigenous Leafy Vegetables: The Case of Coffee Bay, Eastern Cape Province of South Africa.' 2 Donatien Ntawuruhunga, 'Farmers' Knowledge, Attitude and Practice towards African Indigenous Vegetables in Kenya' (Jomo Kenyatta University of Agriculture and Technology, 2016)

centres in the county began to record high levels of malnutrition in children and general poor health in adults, who reported ailments such as high blood pressure, diabetes and poor vision.

### Promoting indigenous vegetable production

Building on its mandate to attain a balanced food system that promotes biological diversity, the Biovision Africa Trust, Busia team visited various homesteads in Singi division. Anastacia Muleka, a mother of four, was one of the residents who welcomed the team. Her attitude towards indigenous vegetables was not any different. For her,



she believed they were for old people and found local vegetables bitter and hard to prepare and as a result she only planted Kales (*Sukuma wiki*).

### Knowledge Attainment

Based on these negative attitudes, BvAT officials working in these regions first had the task of enhancing knowledge on benefits of indigenous vegetables as a way of changing the negative perception of locals and farmers in Busia county.

Through BvAT, Anastacia went through training on how to plant a variety of local vegetables and also on how to prepare them to maximise their nutritional value. To her surprise, she found the local vegetables cheaper to grow and easier to cook than the kale she was previously accustomed to. Her family found the vegetables tastier too, and before she knew it, indigenous vegetables became a staple diet in her home.

Encouraged by the positive response from her family, Anastacia began to grow the vegetables for sale and now boasts of an additional, and much needed source of income for her household.

"Thanks to my frequent consumption of local vegetables, I seem to be growing younger, My skin is smooth and glowing, I'm back to being the village beauty"

### Indigenous Vegetables - Nutrient Value

Indigenous Vegetables	Local Name	Protein (%)	Ca (mg)	Fe (mg)	Vit A (mg)	C (mg)
Amaranthus	Terere/mchicha	4.0	480	10	10.7	135
Spiderplant	Saga	5.1	262	19	8.7	144
Nightshade	Managu/Osuga	4.6	442	12	8.8	131
Cowpea	Kunde	4.7	152	39	5.7	8.7
Pumpkin	Malenge	3.1	40	2.1	3.9	170
Jute mallow	Mrenda	4.5	360	7.7	6.4	187

Source: Maundu et al, 1999, Abukutsa-Onyango 2003.

# Making Money from Organic Fertilizer



*By Victoria Mutinda*  
**Location:** Kangundo Sub county  
**Founding year:** 2015  
**Membership:** 12 members

**Background:** Christian Foundation Initiative is a group of 12 members who are all small holder farmers. who had used inorganic farming practices such as chemical fertilizers and pesticides on their farm. They reported low yields, and feared for their health as a result of consuming chemically contaminated foods. They approached BvAT to seek information on organic fertilizer and eco- friendly pest management.

**BvAT Intervention:** The 12 members were trained on ecological farming practices. Specifically, training was done on crop diversification, composting in order to restore soil nutrients. In addition, eco - friendly pest management training was done to reduce pest management costs and stop use of chemical fertilizers.

**The Strategy:** The group started collecting wastes from slaughter and other botanical plants for organic fertilizer preparation. The green materials, solid or dried materials, powder form materials would then be decomposed for a period of four weeks before they

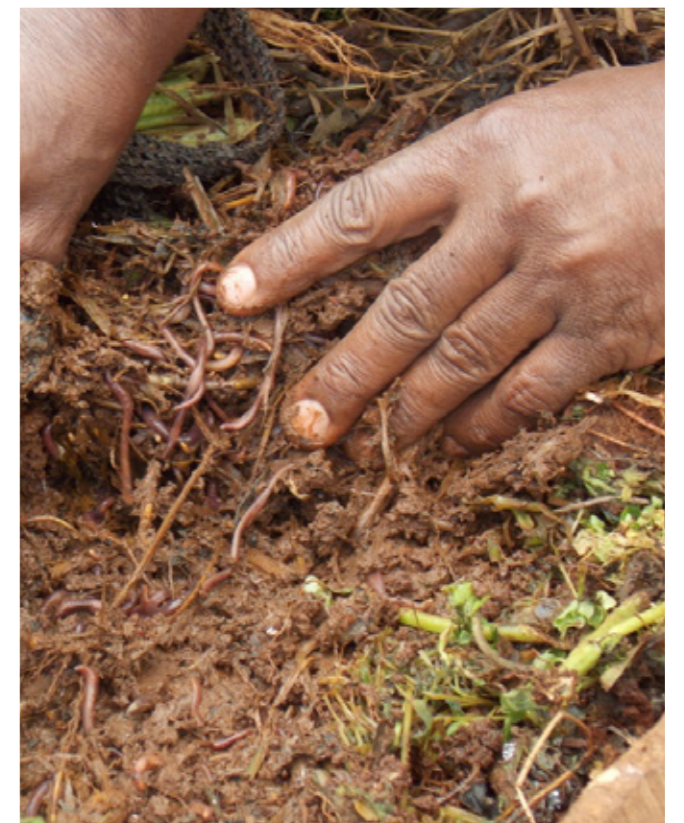
are grinded using a fuel utilizing machine. Allowing the wastes to decompose is important because raw manure includes threats to both human health and to the environment (e.g. pollution of the water ways). To reduce such risks, organic farmers usually compost manure before applying it (Infonet, Biovision)

When the group started production of the fertilizer, they only produced enough for their individual farms. However, as they mastered the skill they increased the production and had samples of the fertilizer tested to ensure balance of crucial nutrients. The fertilizer produced has Carbon [C], Nitrogen [N], Phosphorous [P], Calcium [C], Iron [Fe], Potassium [K], Oxygen [O], Copper [Cu], urea, Zink [Zn] and Chloride[n].

The group has been producing organic fertilizers since 2015 and the fertilizer is packed and sold in kilograms at KES.70 per kilogram. Their customers are based in Kangundo sub county, Machakos, Makueni, and Nairobi.

**The Successes**

- Increased crop yield from application of this organic fertilizer.
- By selling compost manure they have increased and diversified their sources of income
- Improved livelihoods for families and the community



# Busting Myths on Organic Farming through TOF Magazine and Radio



"I was willing to take up this new method of farming, but I was a bit hesitant at first. I feared that pests would be more attracted to my crops if I used manure as fertiliser."

By Veroniah Wamiti

Like many farmers who are accustomed to conventional farming practices, Mr Isaac was never keen on trying compost making because he believed it was messier, time consuming, and produced lower yield compared to using chemical fertilizers. Such misguided notions are common among smallholder farmers leading to overreliance on chemical fertilizers which is a major cause of soil nutrient depletion.

In his days as a school going youth, Mr. Isaac, now a middle scale farmer in Nyandarua South sub-county, was praised by his teachers for always wanting to learn more than what was taught in class. He grew to become a passionate farmer, earning just enough from his 4-acre farm to support his family from the sale of Irish potatoes and fresh milk from his dairy cows. With a 4-acre plot, Mr Isaac had the capacity to produce much more only if he adopted organic farming.

### Depletion of soil

Depletion of soil fertility in smallholder farms has been associated with a decline in per-

capita food production in Africa.<sup>1</sup> Kenya is not spared from this plight. Although manure application is a well-known practice it is still not efficiently used and research has related this to limited access to information on compost making and use.

When one of his friends, who owns a farm nearby, first spoke to him about benefits of organic farming, he was not convinced but he wanted to know more about this new farming method. A curious man by nature, Isaac requested his neighbour to introduce him to the field staff at the Biovision Africa Trust (BvAT) resource centre in Murungu town. He wanted to get this information from professionals who assure him that using compost on his farm would improve his crop quality and quantity.

### TOF Magazine and Radio

The Organic Farmer (TOF) is an information service for farmers in Kenya and the wider East African region, with a focus on providing practical advice through print (a monthly farmers' magazine) and broadcast (radio programs). These channels

<sup>1</sup> Naido, K., (2009). *The practice, constraints and perceptions of improving soil quality through manure application: a case study of three smallholder farmer groups.*

of communication, run under the BvAT Farmer Communication Programme, provide farmers with information on environmentally friendly farming methods and advice on how to increase yields using simple, sustainable methods. Through this platform, TOF aims to facilitate the sharing of information, knowledge and experiences from farmer-to-farmer, and experts-to-farmers and vice-versa.

At BvAT Farmer Resource Centre, Mr Isaac was able to get comprehensive information on organic farming practices and had access to evidence based literature. He became an ardent reader of TOF magazines among other literature in the BvAT office and was convinced to try organic farming. He learned that organic farming is a method of crop and livestock production that relies on fertilizers of organic origin such as compost manure and places emphasis on techniques such as crop rotation and companion planting. The principal goal of organic production is to develop farming techniques that are sustainable and harmonious with the environment.



Among the skills that he learned through BvAT are compost making, crop rotation and companion farming. He uses compost to build and maintain a good soil structure while adding depleted nutrients to the soil. A good soil structure ensures improved circulation of water, air and nutrients which improves plant growth eventually leading to higher crop yield. Adding compost to sandy soils also increases the water retention capacity. Composting is good for soil life and plant growth and prevents soil erosion.

By learning to prepare and use compost, Mr Isaac realized that all the notions he had heard about compost manure were all myths with no scientific base. It is now 4 years since Mr. Isaac started practicing organic farming and he has realized many benefits. He could put to use large amounts of vegetable wastes and cow dung from his cows. He no longer needed to buy chemical fertilizers, and compost making was much more affordable for him. By practising crop

rotation and companion farming he has succeeded in keeping pests at bay.

A major challenge with composting is that it requires a lot of labour and time to prepare and to spread it over the farm but Mr. Isaac confirms that organic farming requires patience and dedication but it is all worth it.

To address a major challenge of marketing his products, Mr Isaac's products are advertised in the monthly TOF magazine where he is linked to better markets. He is currently learning how to control post-harvest losses and how to add value to produce so as to fetch better prices in the market.

"Through compost making, the cost of buying chemical fertilizers for my crops is to me a thing of the past. It is also through compost that the soil fertility in my farm has drastically improved and I now have greater yields and healthier produce."

### Did You Know?

- Farmers who formulate and make their own compost at home can cut production costs by up to 30% and improve their incomes.

### Compost making procedure

- Dig a pit 1.2 m (4 feet) wide and 0.6 m (2 feet) deep, and as long as you need for materials, you have.
- Build a pile in the pit, by putting rough materials such as maize stalks at the bottom, then vegetation and glass and finally animal manure on the layer.
- Add a layer of wood ash (if available) along with urine and mud.
- Next, spread a 5cm layer of bedding with cattle dung and soil. Sprinkle with water until moist.
- Continue adding layers until the material is 30 cm above ground level. Apply water. The heap will shrink as it decomposes.
- Turn over the heap three times. Moisten with water each time. Decomposition needs proper mixing as well as circulation of water and air. You can ensure this by turning over the material three times:
  - o First turning: 10-15 days after filling the pit
  - o Second turning: 15 days later
  - o Third turning: after 2 months.
- At the third turning, you can take it out of the pit and put it back in. This helps the bacteria to get nitrogen out of the air.



# Youth Making Money from Poultry Project

"I was very disappointed about losing my flock of chicken that I had put a lot of effort to see grow. At some point, I blamed the jealousy of members of my family for causing the sudden death of my chicken," he says.



By Michael Wangalwa

Poultry products are an important source of high quality protein to most households in Kenya and a supplementary source of income to small-scale poultry farmers. Small-scale poultry keepers have traditionally favoured the indigenous chicken varieties because of the perception that they are easier to keep and that they are more nutritious and healthy.

Because of traditional perceptions about the immunity of the indigenous chicken, they were rarely vaccinated. In fact, in most rural communities, the chicken are still commonly fed on local herbal remedies as a way of protecting them from diseases.<sup>1</sup> There is however no scientific evidence on the effectiveness of home-based herbal remedies in protecting the poultry from diseases. Unfortunately, contrary to common beliefs, the indigenous chicken varieties have not been spared of the effects of poultry diseases.

In Kakamega County, there has been increased investment in indigenous poultry keeping both by the government and by

smallholder farmers as a way of improving livelihoods of the residents by increasing productivity of indigenous chicken.<sup>2</sup> Despite the many benefits that small-scale poultry keepers can gain from the trade, it has not been a smooth ride.

For many years, farmers in Kakamega County have incurred heavy losses in terms of death of their indigenous poultry. One notorious culprit has been the Newcastle Disease in poultry. Newcastle disease is an infection that manifests as an acute respiratory<sup>3</sup> disease in domestic poultry. Other signs may include diarrhea and depression. The severity of the disease depends on the susceptibility of the host chicken. In particular, young chicks and unvaccinated domestic poultry are very susceptible to the disease. Unfortunately, new castle disease has no cure.<sup>4</sup>

## Newcastle Disease

Newcastle disease is one of the challenges that local farmers in Kakamega like Justus Odhiambo or Justo as he is commonly known, have had to grapple with for a long time. Justus is a father of two and a

<sup>2</sup> Kakamega County. (2016). *Improved indigenous poultry to boost the economy of Kakamega County*.

<sup>3</sup> Veterinary Manual (2018). *Newcastle Disease in Poultry*.

<sup>4</sup> Biovision Africa Trust. *New Castle Disease*.

resident of Nyapeta village in Kakamega County. Mr Odhiambo is 34 years old and has been trying his hand at poultry keeping. In 2017, he helplessly watched as 70 of his indigenous chicken as well as hundreds of chicken belonging to his neighbours, perished of disease. What made it even more painful was the fact that the deaths occurred in a matter of weeks.

The death of his chicken was the main reason that pushed Justus to join Nyapeta Youth Group with the hope of finding a solution from the group members.

## Training in Chicken Rearing

Nyapeta Youth Group is a self-help group within Nyapeta village that focuses on training the members on modern techniques of rearing healthy chicken. The aim of the group is to provide the members with the necessary skills to ensure that they are rearing quality flock that can assure them of profitability from their hard work and reduce the risk of losing chicken to preventable diseases.

The group meets twice every month. It is during the meetings that the members are trained on practical aspects concerning poultry production. The group has a collaborative arrangement with Biovision Africa Trust (BvAT). Specifically, a field facilitator from BvAT works with the members of the group using integrated channels of communication such as TOF magazine and listening to the TOF Radio to empower them with the right information pertaining indigenous poultry production. According to the testimony of the members, being part of the group and especially the working partnership with BvAT has been a good opportunity for the members to learn about poultry diseases and to find practical solutions on how to prevent and deal with the diseases when the infections occur.

"It is while at the youth group that I learnt about Newcastle diseases (NCD) and came to understand that vaccination against NCD can do wonders. It is when we were taught that I was truly able to link the death of my chicken to NCD," exclaims Justo.

## Vaccination of Poultry

NCD<sup>5</sup> vaccination is encouraged as part of organic farming. In order to build the capacity of the group, 10 members of the group were trained through practical demonstration on how the vaccination process is carried out on chicken. The vaccine is administered in form of two drops through the nostrils or on the eyes of the chicken. Alternatively, the vaccine can be mixed in drinking water. This is the easiest way and even individual farmers easily implement it on their own once they have been trained on how to mix the vaccine in drinking water. A quantity of 10 ml can satisfactorily take care of up to 30 birds for a period of at least 3 months.

## The Successes

After the training and by continually participating in the activities of the group, Justus can now rear his flock of chicken without losing any of the birds to preventable diseases. He now boasts of a flock of 150 birds and can comfortably sell at least 10 full-grown birds in the hotels in Mumias town on weekly basis.

"I sell one bird at an average of between 500 to 700 Kenya shillings. In a single week, I sell up to 10 chicken to the hotels in Mumias. In addition, I also

<sup>5</sup> New Castle Disease

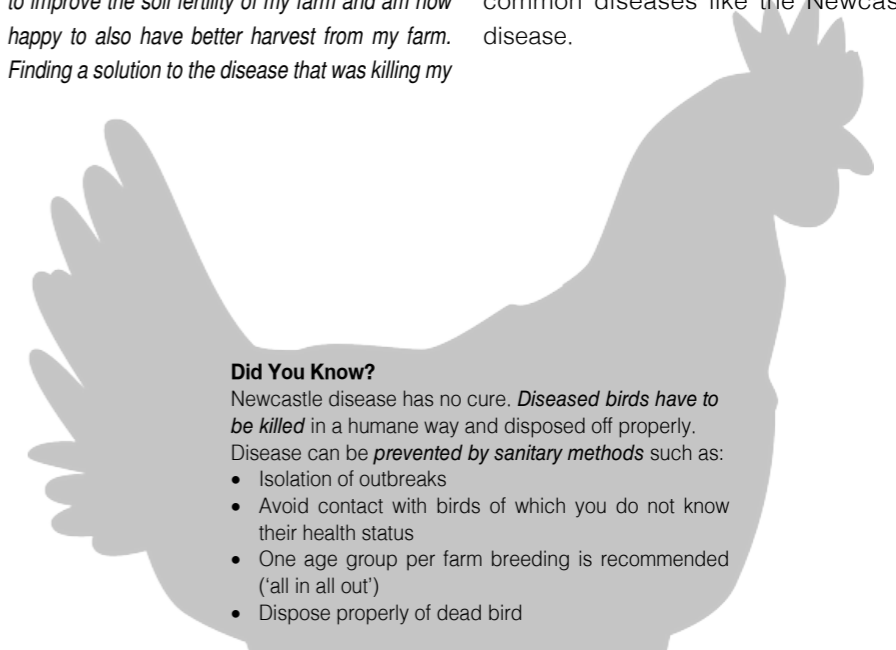
sell at least 4 crates of eggs every week. My family is also healthy because of consuming chicken meat and eggs," claims Justus.

The trainings are not limited to poultry production. BvAT also trains farmers on aspects of plant, human and environmental health. For instance, the members of the youth group are also trained on how to make biological fertilizer from the chicken droppings.

"By using manure from poultry, I have been able to improve the soil fertility of my farm and am now happy to also have better harvest from my farm. Finding a solution to the disease that was killing my

chicken has helped me to live in harmony with my parents and brothers. I am very happy about the good work that Biovision Africa Trust is doing," he concludes.

Today, Mr. Justus Odhiambo is not just a happy farmer but also a trainer of trainees (TOT) in poultry production. Justus is using his new knowledge and skills to reach out to other youths in his village. He is training members of his community on different aspects of indigenous poultry production and on the value of vaccination in tackling common diseases like the Newcastle disease.



## Did You Know?

Newcastle disease has no cure. *Diseased birds have to be killed* in a humane way and disposed off properly. Disease can be *prevented by sanitary methods* such as:

- Isolation of outbreaks
- Avoid contact with birds of which you do not know their health status
- One age group per farm breeding is recommended ('all in all out')
- Dispose properly of dead bird

## Newcastle disease

- Newcastle disease is an infection that manifests as an acute respiratory disease in domestic poultry[1].
- Other signs may include diarrhea and depression.
- Respiratory signs include gasping, coughing, sneezing.
- The severity of the disease depends on the susceptibility of the host chicken.
- Young chicks and unvaccinated domestic poultry are very susceptible to the disease.
- In Kenya, mortality rates are usually high in January (80-100%) in non-vaccinated flocks.
- Outbreaks are usually associated with the introduction of indigenous chickens from elsewhere especially during Christmas festivities when they are sold in open-air markets
- Transmission is by direct contact with secretions, especially faeces, from infected birds or by contaminated feed, water, implements, premises, human clothing, etc.
- Disease can be prevented by sanitary methods such as:
  - o Isolation of infected birds.
  - o Avoid contact with birds whose health status is uncertain.
  - o Ensure one age group of birds per farm breeding.
  - o Proper disposal of dead birds.

# Hidden Gold in Mango Production



*'The most painful part of it, is how much I spent on chemicals to control pests and diseases on the farm. I could spend up to KES. 10,000 per production season with hope for better production, I was spraying after every two weeks from flowering until the Mango fruits where mature,' Francis added.*

By John Mutisya

Two hundred mango trees, 10 years of hard work and no tangible results to show for it, was too much to bear for any 65 year old farmer whose initial plan was to reap from his orchard in his retirement days.

Mr Francis Mutinda and his wife started this project as retirement plan and together they put all their resources and efforts on this mango project. When the Biovision team met Mutinda last year, the old man narrated the sad fate that had befallen mango farmers in Mikuyu village, Machakos. His face tired and embarrassed at what he may have considered his failure, evident worry of what his future, and possible regret by thinking he had made the worst mistake of his life at the most crucial stage of his life.

A walk in the farms in this village reveals a sad state of affairs. Bushes of barren mango trees highly evident, rotten heaps of mangoes attacked by fruit flies while in others only stumps visible, depicting signs of desperate farmers who had started cutting down the trees. His story is that of never ending expenses with no returns.

### Mango Cultivation in Kenya

The arid eastern region produces 61% per cent of all mangoes, followed by Rift Valley at 30% and Coast, which produces 28%.<sup>1</sup>

With Mango value chain gaining momentum in all the three counties in the Eastern Region, Machakos, Makeni and Kitui, there has been a significant deficit of information on how to adopt environmentally friendly and sustainable solution to improve crop yield by proper tree feeding, management

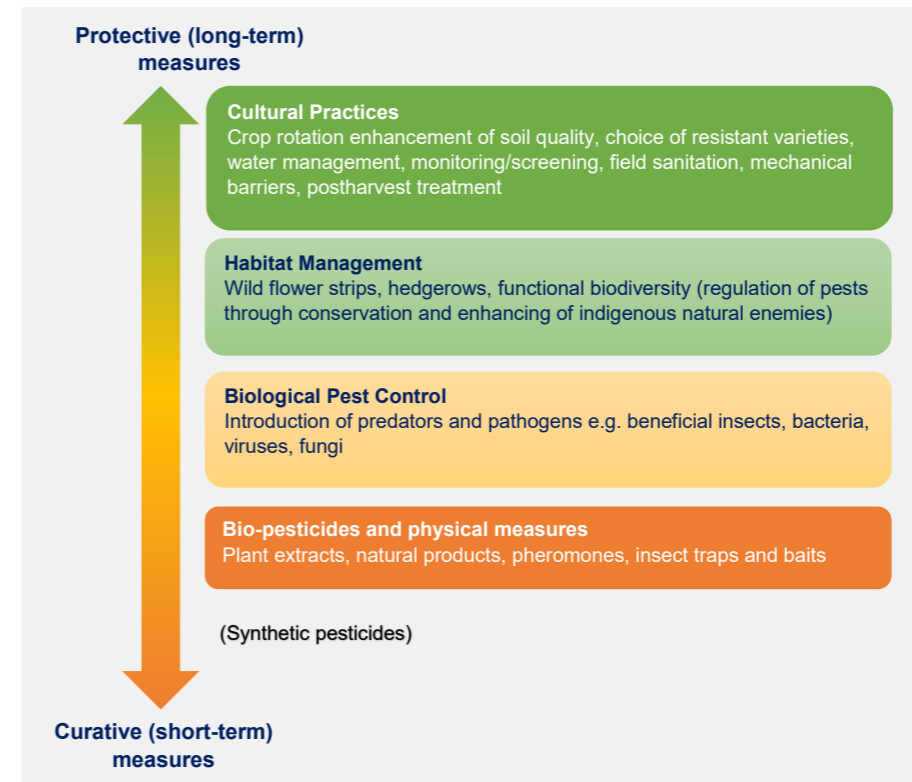
<sup>1</sup> Jomo Kenyatta University of Agriculture and Technology, (n.d). Mango Cultivation in Kenya. [http://kuates.co.ke/MANGO\\_CULTIVATION\\_IN\\_KENYA.pdf](http://kuates.co.ke/MANGO_CULTIVATION_IN_KENYA.pdf)

and pest control.

### Initial assessment of the orchard

An immediate assessment of the farm and the mangoes was conducted by the BvAT team. The mango fruits from Mutinda's farm had a rotten flesh inside the mango, the flesh had maggots and the skin of the mango was manifested with black spots. It was determined that his farm had a severe attack of the fruit fly pest. The mango trees also lacked the necessary nutrients and it was evident that the farmer also lacked knowledge on how to feed the trees with the required nutrition. This was the same story for other orchard farmers in the area.

There was need for a quick intervention to be put in place. Through Katumani BvAT resource centre, PELUM Kenya, and Katoloni C.B.O, five groups of Mango farmers were mobilized for training and information sharing on best practices in farming mangoes and fruits.



Katoloni C.B.O and BvAT played a key role in bringing the group representatives together, while PELUM-Kenya focused on aiding in formation of a marketing association. A specialist from Kenya Biologistics was invited to supply fruit fly traps for control of the pest.

The trap consists of a pheromone - a chemical that attracts the male flies and traps them, reducing fertilization of female eggs.<sup>2</sup> The trap is positioned inside a small tin just below the lid, and then the tin is hanged on a mango branch using a string. one trap can serve between 6 to 10 Mango trees.

### Organic Farming Technique

During the meetings, Katumani staff addressed the key areas of concern. Specifically, the farmers were taught organic farming techniques and how to feed their trees with necessary nutrients. They were advised to adopt well decomposed manure from livestock or from composting and applying just before flowering for improved

<sup>2</sup> Biovision Africa Trust. Fruit Flies. [www.infonet-biovision.org/PlantHealth/Pests/Fruit-flies](http://www.infonet-biovision.org/PlantHealth/Pests/Fruit-flies)

branches which provide favourable hideouts for pests.

Mutinda, determined to save his retirement dream, implemented everything that he learned in the meeting. He even bought the pheromone fruit traps. Not only was he able to increase his fruit production, the quality and size of his fruits had also improved.

With a beaming smile on his face, Mutinda could not hide his happiness, he shared his story with new members and he is a living example of how organic farming and implementing best practices had solved his 10 years of farming sorrows.

Based on his success, Mango farmers replicated his strategies, they bought the fly traps and started to use composting and timely pruning and more farmers such as Annah Muli started to record their own successes. The farms that had once stood gloomy, dry and infested with fruit flies were now full of mango trees that were thriving with hope of a good yield.

performance. Farmers also learned the importance of timely and proper pruning to enhance air circulation and reduce bushy

**Did You Know?**

- If not managed, fruit flies can cause 100% of crop loss

**Home-made Fruit Fly Trap**

- Take a plastic bottle
- As bait, use 1/2 cup vinegar, mix with water
- Add 4-6 drops liquid dish soap (it heavies down the wings and the fruit flies drown), do not stir
- Then take a pen or pencil and poke 4 to 5 holes in the plastic, just big enough for a fruit fly to fit into, about 7mm. Once a fruit fly crawls in, it cannot get out. You would think they would just fly back out through the holes, but they will not! If you see fruit flies crawling around on the surface of your plastic container but not going inside, make the holes larger
- Hang the bottle in an area where you have seen most fruit flies. Depending on the amount of fruit flies you have, you can expect to start seeing the bottle fill up within just a few hours.

<https://www.infonet-biovision.org/PlantHealth/Pests/Fruit-flies3>

# Making Money from Tree Tomato: Farmer to Farmer Learning Boosts Productivity



"I discovered tree tomatoes almost by chance. Two years ago, I was reading the Organic Farmer Magazine, which at that time was featuring a farmer by the name George Wambugu. Mr Wambugu is a tree tomato farmer from Nyeri and had been identified by the Organic Farmer Magazine team during the agricultural show in Nakuru."

young forests and in return care for the tree seedlings.

**Shamba system** involves farmers tending to tree saplings in state-owned forests in return for inter-cropping. The main advantage of the system is that it allows local communities to participate in conservation of forests while at the same time meeting their food needs.<sup>1</sup>

**Unprofitable farming methods**  
Unfortunately, farming in this area was largely unprofitable. At the time, farmers in the area commonly practiced mono cropping with the main crops as maize and potatoes. The system of farming was monotonous and was prone to failures resulting from erratic weather patterns and pests. Mwalimu Maathai had to think beyond his teaching career.

Being a teacher allowed Mr. Maathai to put his research skills to good use in order to find information that would aid his passion in farming and improve his output as a farmer. His interest in farming motivated him to value information sourcing. As he put it,

**Mentorship**  
He immediately called the contacts he found in the magazine. Following the very encouraging encounter with the team from BvAT, Mwalimu decided to embark on

<sup>1</sup> Witcomb, M. & Dorward, P. (2009). An assessment of the benefits and limitations of the shamba agroforestry system in Kenya and of management and policy requirements for its successful and sustainable reintroduction Agroforest System

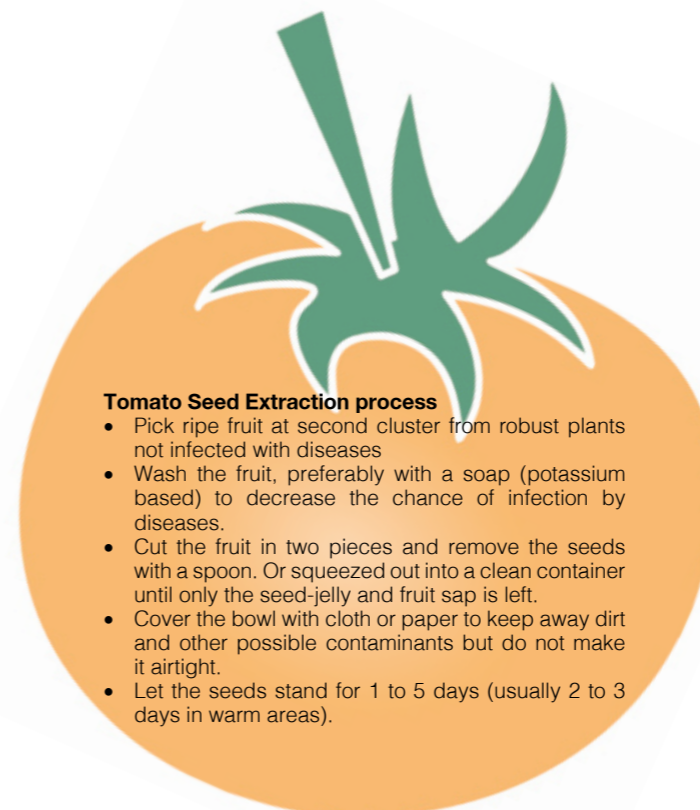
By Peter Murage  
The Organic Farmer Magazine a publication by Biovision Trust Africa, has been a source of evidence-based information for smallholder farmers in Kenya. The aim of the magazine is to disseminate knowledge and share best practices for farmers to replicate in order to improve the quality and yield of crops from their farms. Although the target readers are smallholder farmers, a number of people including those who initially were not into commercial farming have read the magazine and adopted farming as a supplementary source of income for their families.

Mwalimu, as he is commonly known, is a primary school teacher in Nakuru County who took up commercial farming after reading a feature story in the Organic Farmer

Magazine. The story was about a tomato tree farmer who was planting tomato trees in Nyeri County.

**The Shamba System**  
As a husband and a father, the burden of feeding and educating his children lay squarely on his shoulders. This was almost impossible with his income as a teacher. This made Mwalimu to be constantly on the lookout for opportunities that would supplement his income from teaching and allow him to take care of his parental responsibilities and to give his family a better life.

Mr Maathai, a teacher in Milimani Primary School did not own land but with others in the area, was farming through the state forest farming (**shamba system**) where local residents are allowed to farm in



**Tomato Seed Extraction process**

- Pick ripe fruit at second cluster from robust plants not infected with diseases
- Wash the fruit, preferably with a soap (potassium based) to decrease the chance of infection by diseases.
- Cut the fruit in two pieces and remove the seeds with a spoon. Or squeezed out into a clean container until only the seed-jelly and fruit sap is left.
- Cover the bowl with cloth or paper to keep away dirt and other possible contaminants but do not make it airtight.
- Let the seeds stand for 1 to 5 days (usually 2 to 3 days in warm areas).

commercial fruit farming. In addition, he was assisted to make a field exchange visit to Nyeri, where he met and shared practical experience with Mr. George Wambugu, the farmer who had been featured in the Organic Farmer Magazine. Mr. Wambugu provided a very practical and elaborate explanation about the tomato tree farming and management.

Armed with the new knowledge and the surety of having a reliable team at BvAT that he could rely on when he needed advise, Mwalimu started tomato tree farming in his ¼ an acre farm. He initially planted the red oratia tree tomato fruit seedlings.

**The Successes**  
Today Mwalimu Maathai is a happy farmer who has turned his land into a profitable venture and a training site for other neighbouring farmers. The income from the enterprise has so far enabled him to venture in highland arrowroots production. In particular, Mwalimu farms the Rwanda variety of highland arrowroots, which he sells at KES.50 per seedling while the grafted tree tomato fruit seedlings are sold at KES.50 per seedling.

In addition, he has ventured in to tree nursery management where he propagates both

exotic and indigenous trees species. On average, each seedling from the nursery is sold at KES.10.

Mwalimu is not only a model farmer in his community but has also become a resource person who even trains other farmers on behalf of the Ministry of Agriculture.

Through participating in agricultural exhibitions, Mwalimu secured a tender to supply both Jirani and Woolmat supermarkets in Nakuru with tomato tree fruits. In total, he supplies a total 100kgs of



tree tomato fruits to the two supermarkets on a weekly basis. This is in addition to another 100kg, which he individually sells locally per week. The cost of one kilogram of tree tomato on average is KES.100. In a good month, Mwalimu makes at least KES.80,000 from the sale of the tree tomato fruits.

The income generated from the enterprise has so far enabled him to acquire an additional one acre of land, which he intends to use to expand the tree tomato farming.

*"The earning from the farming enterprise surpasses my monthly earning from the teaching with a large margin. I may have to quit from the teaching profession so as to concentrate on expanding the fruit farming onto my newly acquired farm,"* says Maathai.

The farmer encouraged his fellow group members to dedicate at least a ¼ an acre of their farms to tomato tree farming. This way they can be able to meet the ever-increasing demand of tomato tree fruits in Nakuru town. Apart from generating income for the farmers, fruits from tomato tree are a good source of nutrition for the farmers and their families. Mwalimu also encourages the farmers in his group to be willing to build networks with other farmers and to share farming related information with other farmers even those beyond their communities because that is the only way through which all farmers can grow and benefit from their farming activities.

## Diversification: Income from Tree and Flower Nursery



*“after staying in darkness for all these years without proper farming knowledge, how can I even think of stopping something which puts food on my table, I will farm till my energy is all down”*

**By Alfred Amusibwa**

Mr.Kefa Amulabu recalls the very first day BvAT officers visited him on his farm located in Bungoma county, Kimilili Sub-County.

He had a vast piece of bare land that was constantly affected by soil erosion during heavy rains.

Mr Kefa had given up on farming all together. But with continuous visits to his farm and constant training and advise specifically on how to improve its fertility using compost fertilizer. Mr Kefa wanted to invest in a different type of farming - tree nurseries and flower farming as a business came to his mind.

The farmer was taken through nursery establishment, seed selection and treatment, nursery management practices and grafting.

### The Successes

To stop soil erosion, he had to improve tree cover in his compound. With continuous use of compost fertilizer, his farm fertility has increased contributing to increased crop yield and most importantly trees and flower business changed his way of living. Today Kefa receives tenders from schools, homesteads and government institution for landscaping. During planting, Mr Kefa advises his clients.

According to Mr Kefa, tree seedlings with highest demand are cyprus, blue gum, and pawpaw. On average, Mr Kefa can make KES.10000 – 15000 on a monthly basis depending on the demand. He sells a tree seedling and a flower seedling at KES.10 and KES.15 respectively.

Kefa did not have electricity in his home but through the sale of trees and flowers,

he was able to connect electricity in his home. Connecting his home to electricity opened up new business opportunities, he now charges phone batteries and other electric gadgets at a fee hence generating more income..

Kefa has attributed his progress on three main issues, the trainings and individual farm visits and advise, reading the Organic farmer magazines. He is planning to increase the area coverage of flowers and trees, he is also collecting more money to open up a shop, drill a borehole for water to help him during drought and plans to employ three people to help him manage his tree farm.

He is also set to train other farmers through Chief barazas and those who visit his home so that they can also benefit from his skills.

## Appreciation



### Developed and Designed by



### Articulate Edits Limited

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**Photo Credits:** Biovision Africa Trust.

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