

# Supporting and Scaling Up Youth Agripreneurship in Kenya

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For more information on USTADI, visit [www.ustadi.org](http://www.ustadi.org)



### About CTA

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### About IFAD

The International Fund for Agricultural Development (IFAD) invests in rural people, empowering them to increase their food security, improve the nutrition of their families and increase their incomes. IFAD is an international financial institution and specialized United Nations agency based in Rome, the UN's food and agriculture hub.

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# Summary

## Supporting and Scaling Youth Agribusiness in Kenya

*This analytical document on rural youth agribusiness is a source of evidence-based knowledge for youth in agriculture, or those doing agribusiness as well as organisations or entities implementing or supporting youth agribusiness in Kenya.*

The 9 articles in this document cover themes such as access to finance, business mentorship, ICTs and social media for agribusiness, market linkages and access that effectively shape-up and enhance rural youth agribusiness in Kenya and beyond. The articles were submitted by authors who responded to a call for articles launched by the project.

**Chapter 1** details how Youth Economic Empowerment through Agribusiness in Kenya (Vijabiz) provides financing for the youth to engage in profitable agribusiness. It recognises that agriculture employs up to 70 per cent of Kenya's rural population, and that, globally, the average age of the rural farmer has reduced over the years from 60 to about 34 currently. This means more

young Kenyans are now taking up agriculture to create wealth and reduce poverty. However, their greatest challenge is funding. In recognition of this, Vijabiz shortlisted EagleSight youth group in Naivasha, Nakuru County, for capacity assessment. At the time of shortlisting, the group of 13 youth was self-funding through a merry-go-round and doing horticultural farming. However,

funding was never sufficient, besides other challenges, including poor prices for their produce, inconsistent weather patterns and difficulty in accessing the far-flung two-acre farm. They therefore thought opening a cereals shop to sell a variety of grains to alleviate some of these challenges. But this would require more money, which they did not have. It's at this point that Vijabiz came into play, and helped EagleSight to secure a KSh 200,000 (USD 2000) loan from the government's Youth Enterprise Development Fund and another KSh2 million (USD 20,000) grant from IFAD. Today, thanks to this financing, EagleSight owns two cereals shops and a posho mill fully equipped with Grade 1 and 2 cereal grinders, and there is more income for the members and job opportunities for others along the value chain.

**Chapter 2** narrates how Vijabiz nurtured and helped two youth groups to scale up their agripreneurship. Greenbelt is one of the groups that was started by three young men. The trio would buy milk from the neighbouring Nyandarua County and ferry to clients in Nakuru using motorbikes. They then joined hands with 11 others with whom they pooled resources and expanded the venture – bought two old freezers to store milk longer and opened milk kiosks. However, people still went for packaged milk with the big brands, and the youth group's profits remained low. They were about to give up when Vijabiz showed up and helped them acquire a pasteuriser, a chiller and a generator. They were also trained on how to transform their business. The other group, Greenthumb CBO, was engaged in fish farming. However, this group lacked the necessary knowledge, infrastructure and equipment to profitably engage in fish farming. Vijabiz turned around the youth's fortunes by training the members on fishpond management and technology that enabled them to monitor ponds to determine water quality and health of the fish. They also won a grant of KSh 500,000 (USD5,000) and equipment worth KSh 1 million (USD10,000).

**Chapter 3** is a study narrating how improving market access, linkages and information boosts farming among the youth. Some of the barriers to market access that Vijabiz sought to remove, according to the study, were lack of social capital, high transaction costs, poor infrastructure and low bargaining power. The study selected youth groups that benefited from the Vijabiz programme in Nakuru County, using a before- and after-test research design. The assessment included market

and information access situation before and after the intervention. The study found out that as a result of the intervention most youth groups (86.7 per cent) admitted they had improved their market and information access, while only 13.3 per cent did not improve market access and linkages. The study concluded that in an attempt to scale up agripreneurship among the youth, Vijabiz promoted youth participation in agriculture, linked the youth to financial service providers and provided business mentorship that helped them to reduce their costs and increase profits.

**Chapter 4** covers how the youth in Kuresoi South, Nakuru County, were empowered to overcome production challenges brought about by the effects of climate change. The article focuses on the activities of Cherokeyet CBO in Kuresoi South, through one of its youth groups, Cherokeyet Set Kobor Youth Group. Because of its proximity to the Mau complex catchment area, the group took up tree seedlings and Irish potato seed multiplication for artificial agroforestry and environmental conservation. The group's main aim was to fight food insecurity in the area while contributing to environmental conservation. Vijabiz linked the group to Watafiti Consultants, an agribusiness consultancy, capacity building and management firm, which took the group members through an eight-month training and mentorship programme on building profitable and sustainable enterprises. Watafiti Consultants also brought on board other stakeholders, including Kenya Forestry Research Institute (KEFRI); certified input providers such as Osho Chemicals, Baraka Fertilisers, Isinya Feeds and AgriCo East Africa Ltd; Vision Fund Kenya; and Joyful Women Organisation. In the end, using loans from Vision Fund Kenya, the group was able to rent 10 acres of land for the Irish potato seed multiplication and each member was able to take home KSh36,700 (USD 360) after three months. The group also planted indigenous and fruit tree seeds and later sold the seedlings to the group members and the local community for transplanting. In 10 years, each indigenous tree is expected to give a return of KSh11,500 (USD110), while every fruit tree is estimated to give KSh8,000 (USD 80) per harvest season after two years from planting.

A study on how women's entrepreneurial behaviour affect the resilience of dairy agripreneurs and the performance of the enterprise in Kenya is covered in **Chapter 5**. The study identifies several challenges





that reduce the productivity and general performance of Kenya's dairy sector. They include poor quality and unavailability of feeds during droughts, controlling livestock diseases, lack of credible sources of information, breeding services and credit accessibility. For dairy agripreneurs to surmount these challenges and continue enjoying the benefits of dairy farming, they must be resilient. The study, conducted in Murang'a County in Central Kenya, purposively sampled 682 smallholder dairy agripreneurs (480 males and 202 females) from four sub-counties – Gatanga, Kiharu, Maragwa and Kangema, using a quantitative research design based on cross-sectional farm household survey. The study found out that both men and women youth agripreneurs who were future oriented were more resilient, while competitive aggressiveness of women positively influenced their agripreneurial resilience. Also, innovativeness and risk-taking behaviour were found to enhance the resilience of women dairy agripreneurs. Overall, in the region of the study, women agripreneurs seem more competitively aggressive than their male counterparts because marketing roles in dairy production are considered as a woman's job, thus they better understand competition and how to beat it. The same applies to risk-taking because women have to go out of their way to finance their agribusinesses because they don't own collateral for bank loans such as land. The study, therefore, urges policymakers and developmental agencies to empower women to be more risk-takers, competitive aggressive and innovative to enhance women agripreneurship.

**Chapter 6** is a study on how dairy youth agripreneurs in Kenya take up climate-smart dairy (CSD) technolo-

gies to mitigate the adverse effects of climate change and upscale their agribusiness. Climate-smart agriculture (CSA) aims to achieve three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions. The study identifies six CSD technologies and practices as water-smart, energy-smart, nutrient-smart, carbon-smart, weather-smart and business and knowledge-smart. The study collected data through focus group discussions and key informant interviews from a sample of 384 dairy youth agripreneurs in Nakuru County in January and February 2020. From the findings, dairy youth agripreneurs prefer to feed their livestock using concentrates as carbon-smart technologies because they lack space to grow their own fodder. As for weather-smart technologies, the dairy youth agripreneurs are not willing to acquire livestock insurance because they think it is too expensive. Instead, they prefer climate-smart housing for livestock. The study also found that the younger a dairy farmer is, the less likely they are to adopt improved crop varieties for fodder as a climate-smart technology. This is because the improved varieties take a little more time to mature and the young farmers are not patient enough to wait. They want quick returns. To improve the adoption of CSD technologies among youth dairy agripreneurs, the study recommends extension services to review their programmes that are majorly production based and include the capacity building on the preferred climate-smart technologies.

The study in **Chapter 7** sought to determine the preferences and willingness to pay for climate resilient



potato varieties by youth farmers in order to increase their resilience to climate change and scale up youth engagement in potato agribusiness. The study recognises that climate resilient potato varieties have been developed and disseminated by various research institutions in an attempt to address the adverse effects of climate change on potato production. However, adoption rates of these varieties remain low among youth farmers. Previous studies attribute the low adoption rates to financial and resource constraints, inadequate training and lack of extension services. The study randomly sampled 119 youth farmers from four wards (Mariashoni, Elburgon, Turi and Molo) in Molo Sub-county, Nakuru County. Data was collected through a household survey using structured questionnaires in a discrete choice experiment and was analysed using mixed logit model. Results revealed that resistant to pests and diseases was the most preferred trait with the highest value of willingness to pay while high yield was the least preferred attribute. Female youth farmers mostly preferred resistant varieties unlike their male counterparts who mostly preferred high yielding varieties. Breeding programmes need to incorporate youth farmers' preferences to increase adoption of improved potato varieties and scale up youth engagement in potato farming agribusiness. The preferred potato attributes for adaptability to climate change by youth farmers from the study were resistance to pests and diseases, low water requirements, short maturation period and high yield.

The study in **Chapter 8** sought to establish the impact of information and communications technology (ICT) usage on the income of youth agripreneurs in Kenya. Usage of ICT tools such as mobile phones, television and radio in accessing agricultural information and undertaking transactions has gained traction in the last decade in the development of youth-based agrienterprises. The youth agripreneurs can use the technology to access market information, data on inputs and links to financial institutions for credit facilities. This study used structured questionnaires to collect data from 183 pineapple youth agripreneurs from four wards (Gakoe, Kanyoni, Kamwangi and Mangu) of Gatundu North Sub-county, Kiambu County. The survey revealed that the most commonly used ICT tools in accessing technical, market and financial information among youth agripreneurs were mobile phones (86 percent), radio (79 percent) and then television (59 percent). Younger farmers and better educated youth agripreneurs are

more likely to use ICT tools because they are likely to be highly innovative and more enterprising. Also, youth agripreneurs who had access to electricity in their farms were more likely to use ICT. The study also found that participation in group activities promotes use of ICT among youth agripreneurs because group members find it easier to communicate using the ICT tools. Therefore, to scale up youth agripreneurship in using ICT, the study recommends training of youth lacking formal education on ICT utilisation in their agribusiness, increased access to extension services among youthful farmers, and infrastructural development, especially access to electricity and good communication network coverage. There is also a need for regulation on the high interest rates on digital lending to smallholder youth agripreneurs.

Lastly, **Chapter 9** delves into DairyProfit project that was aimed at creating employment and business opportunities for the youth in the dairy sub-sector. The project was funded by the CTA and implemented in Kenya, Tanzania and Ethiopia. In Kenya, the project was implemented by Perfometer Agribusiness and it facilitated inclusive business relationships by linking/matching youth enterprises in fodder supply and advisory services to dairy cooperatives and processors. The project worked with the youth as technical advisors and extension service providers, and it provided capacity building for the youth to be employable in dairy. Youth were either trained through the on-farm training or in the Dairy and Fodder Academy. The youth who participated in the training reported improved performance in the farms where they worked either as managers or farm operators. Those running their own farms also reported improved production of milk and milk products. One of the key milestones was in fodder processing and supply, where the project identified a mini-silage baler in India that was found to be suitable for the Kenyan context. The baler makes silage of 50-60 kilos that are easy to transport, unlike before when the Kenyan dairy sector relied on balers that made bulky bales of silage weighing 300-400 kilos. The youth accessed the equipment through a competitive grant for which 19 youth enterprises were selected, and are now producing on average 499,913 kilos (over 10,000 bales) of silage in months. The major challenges identified in the project included gender imbalance – 85 percent of all participants were men – short project duration and limited technical capacity.





# 1 CHAPTER ONE

How Vijabiz empowers the youth through agribusiness financing

 By TREZA OGUDAH



## CHAPTER ONE

# How Vijabiz empowers the youth through agribusiness financing

By TREZA OGUDAH

### Introduction

Kenya is often described as an agricultural economy. According to the Food and Agriculture Organization of the United Nations (FAO), agriculture is a key part of the country's economy. It contributes about 26 per cent of the Gross Domestic Product (GDP) and 27 per cent of GDP indirectly. The sector is said to employ more than 40 per cent of the total population and more than 70 per cent of the country's rural population.

Kenya's rural areas have the highest poverty levels. The irony in this is palpable. It is expected that farmers, essentially the backbone of the country, earn enough from their agricultural activities to accord them a comfortable life. Most of them however resort to growing food for subsistence purposes only. The few that sell their products decry the poor returns as middlemen get the lion's share of the fruits of their labour.

You may be familiar with the statistic that puts the average age of a farmer in developing countries at about 60 years. However, research by International Fund for Agricultural Development (IFAD) offers insight on why this might be an outdated statistic, estimating the current figure to be 34. Quite a good percentage of rural youth work in farms, providing the much-needed manpower. The returns, however, are not anything to write home about. The politics around the agricultural sector surrounding pricing, marketing, what gets imported and why, and a host of other factors have affected the view rural youth have of farming. Many are not convinced of the potential agriculture and indeed agribusiness has to free them from the shackles of poverty.

## Why Engage Rural Youth In Agribusiness?

Unemployment levels among youth in Kenya are still too high, despite reports indicating a reduction in percentages over the years. Rural youths are especially affected. Many return to the rural areas dejected after unsuccessful job searches in the urban centres. The situation is aggravated by their inability to make the primary economic activity in the rural areas, farming, profitable. Agriculture is viewed as the thing failures engage in as a last resort. This is, of course, not true.

The success in curtailing this and other misconceptions depends on enacting measures that will help rural youth capitalise on this viable sector to create wealth and reduce poverty levels in their communities. It is becoming more evident that with the advent of technology and other modern ways of farming, rural youth are better placed to be the drivers of change; they are the future of innovative agriculture. Stakeholders must carefully scrutinise available data to better understand the realities of farming as per demographics. The result is a scenario where intentional decisions and investments are made to turn the sector into one that caters for its young and dynamic population.

It is therefore paramount that challenges facing rural youth in agriculture such as access to finance, land, knowledge/information and education, markets and policy support and engagement are addressed.

## Agribusiness Financing

Lack of capital is a major challenge facing rural youth interested in elevating their agribusinesses. Despite having access to ancestral land and a willingness to work it, many are at a loss on how they can make a living off the spaces as they are financially handicapped. The good news is that this situation can be remedied with guidance and assistance from stakeholders in the agricultural sector. A number of partnerships are being forged in the sector to fund agribusinesses. These include Equity Bank and AGCO, a US company which owns the Mercey Ferguson brand. Agriculture Foundation coming together in 2019 to give agribusiness financing on tractors to farmers; and Agricultural Finance Corporation (AFC) and Kenya Crops and Dairy Market Systems (KCDMS) offering grants in Nyanza, Western and parts of Eastern Kenya to spur competitive, resilient market systems in Kenya's horticulture, fodder/feeds, dairy, poultry and agro-dealer sectors.

Groups or individuals seeking financial help can tap into these areas:

- **Self-funding** - A number of youth approach family and friends to get their projects funded. Unfortunately, this can prove unreliable and unpredictable as it is mostly out of goodwill so one cannot dictate how much a well-wisher donates. Chamas (self help groups) have proved to be slightly reliable. This is where a group of people come together with a specific goal. In this case, it could be to contribute a specific amount of money to help fund each other's businesses. However, this is only successful if the individuals already earn enough for their basic needs, with a little more to spare. This is hardly the case for rural youth in Kenya.
- **Loans** - Several organisations now offer youth loans to kick off or advance their businesses. These include government initiatives such as Youth Fund, Uwezo Fund, Women Enterprise Fund and institutions like the Agricultural Finance Corporation (AFC). Youth are encouraged to pursue loan options with initiatives such as the Youth Fund and Uwezo Fund as they do not charge interests on their products.

The AFC, which has been lending to the agricultural sector since 1963, offers specific loans for machinery, agribusiness, livestock and fisheries development, cash crop, horticulture and floriculture development, water development and seasonal crop development. One of the main requirements for loan eligibility is access to land. The AFC is however considering scrapping land as collateral for loans in a bid to increase women's access to the funds. Rural women are especially disadvantaged in matters land ownership due to cultural restraints.

Loans can also be borrowed from macro and micro financial institutions such as banks and Savings and Credit Cooperative Societies (SACCOs). Equity Bank, for instance, has a Kilimo Biashara Loan product for small-scale farmers. This loan finances the purchase of farm inputs such as certified seeds and fertilisers, chemicals and machinery, the hiring of labour and harvesting costs.

- **Grants** – These are non-repayable funds or products disbursed or given by one party, often a government department, corporation, foundation or trust,





to a recipient, often (but not always) a nonprofit entity, educational institution, business or an individual.

Grants are often very competitive. As such, education and training are vital if rural youth are to tap into this resource.

Rural youth should be encouraged to connect with Ministry of Agriculture officials in their counties and constituencies to familiarise themselves with opportunities available for them. Concurrent efforts should be made by stakeholders to reach rural youth, especially in underdeveloped and unexposed areas.

### Enter Vijabiz

Youth and agribusiness may be a fairly new dynamic that is forcing stakeholders to rethink policies and strategies needed to succeed. The Youth Economic Empowerment through Agribusiness in Kenya (Vijabiz) project is pulling its weight by focusing on building entrepreneurship capacity, facilitating use of digital innovation, creating market linkages and facilitating value addition for at least 150 agribusiness groups in the cereals, dairy and fisheries value chains in Nakuru and Kilifi counties. The project is aimed at creating sustainable employment for rural youth in Kenya through active engagement in agribusiness for wealth creation and poverty reduction.

It is hoped that the active engagement part gets rural youth totally sold out on the idea that agribusiness can be all they do to earn a decent living, not just a side hustle with meager results. In the end, it is important that the youth appreciate that the title agripreneur is as good as

the other conventional ones long-favoured by society as the definition of success. The initiative is largely funded by the International Fund for Agricultural Development (IFAD), with co-funding from implementing partners, the Technical Centre for Agricultural and Rural Cooperation (CTA) and USTADI Foundation.

One of the beneficiaries of the project is EagleSight Group from Naivasha, Nakuru County. The group was one of 166 youth groups shortlisted by Vijabiz in 2018 for organisational capacity assessment.

**EagleSight Group** was founded in 2018 by 13 individuals under a merry-go-round formation. Members would each contribute KSh1,000 (USD 10) every month. The amount collected would then be equally shared between two members to use as they pleased in their businesses. This was done on a rotational basis so every member would get their KSh6,500 (USD 65) when their turn came. Today, the group comprised of three women and seven men is a registered company with two cereal shops and a posho mill to their name.

### How is EagleSight navigating the treacherous agribusiness financing terrain?

#### 1. SELF-FUNDING THROUGH CHAMA

After months of employing the merry-go-round system, EagleSight decided to move to table banking. Table banking is a group-based funding strategy where members make weekly or monthly monetary contributions to form a kitty from which members can borrow. At Eagle-

Sight, members were loaned money from the account, which they would then pay back with an agreed interest. Returns from this arrangement raised their antennae to begin thinking about what more they could do to further raise income levels for each member for the long term.

Horticultural farming seemed to be doing well in their area so they decided to grow tomatoes and onions in greenhouses for sale around Naivasha town. Their first stop was the Ministry of Agriculture offices. Members had no prior experience in farming and the agricultural sector in general. They needed some expert advice on how and where to begin if they were to be successful. This move initiated a process that would change their fortunes and get the wheel turning on their agribusiness journey. It is here that they later got wind of the Vijabiz project.

According to EagleSight Group Chairman, 31-year-old Joel Kamau, Vijabiz was very instrumental in their transition from horticulture to cereals agribusiness. Vijabiz explained to them why cereals would be a better option in their locale. Besides, the project only dealt with three value chains – cereals, dairy and fisheries. Why not try their hand at something on which they could receive ready expert advice and training?

The group's savings catered for expenses, including leasing a two-acre piece of land, purchasing maize and bean seeds, managing the farm and harvesting expenses. From an investment of approximately KSh30,000 (USD 300) the group was able to make sales worth KSh100,000 (USD 1000). The success notwithstanding, they noted a number of challenges as far as primary production is concerned.

## Challenges faced in primary production

Primary production is the stage of the value chain that encompasses agricultural activities, fisheries and similar processes resulting in raw food materials. Some of the challenges EagleSight experienced at this stage include;

- Poor prices – The group did not have the resources to transport their yield to the market so they sold the produce at the farm. Brokers would offer low prices that in the end affected their profit margin. The group expected to make about KSh200,000 (USD 2000) but ended up with KSh100,000 (USD 1000) instead.
- Inconsistent weather patterns – Like many farmers

worldwide, EagleSight was not spared the wrath of climate change.

- Difficulty in accessing their farm – The farm was far from their residences and the commute was both time and money consuming. They only visited the farm once a month. Their produce would sometimes be eaten by browsing animals such as goats and cows.

## Solution

These challenges had the group taking stock and weighing their options. Consequently, a decision was made to shift their focus to value addition in the cereals value chain.

### 2. THE YOUTH ENTERPRISE DEVELOPMENT FUND LOAN

EagleSight envisioned opening a cereals shop where they would not only sell maize and beans, but a variety of grains that they could not grow in the limited land they had access to. This move would however require more money than they had at hand.

The perception among many youth, and understandably so, is that one cannot access funds meant for youth in Kenya without a 'god father'. This god father supposedly pushes your application forward so you can have an upper hand over other applicants. EagleSight admits to having this mindset and perhaps resigning to the fact that they may never access these resources after all.

Gradually, they experienced a shift as Vijabiz exposed and encouraged them to try out the different opportunities for funding in and outside the country. Many rural youth lack information on the financial aid opportunities available for them locally. Apart from banks, youth can access loans from, among others, SACCOs and "government" kitties meant for youth and women. Armed with relevant skills for submitting winning applications, EagleSight felt confident to pursue a lead at the Youth Enterprise Development Fund, commonly known as the Youth Fund. This is a state corporation mandated to provide financial and business development services to youth-owned enterprises.

The Naivasha-based youth group applied for a loan with the conviction that if they were to be unsuccessful, it would not be from a lack of trying or a poor application. To their pleasant surprise KSh200,000 (USD 2000) was approved in September 2019. Consequently, the group rented a space at the main market in Naivasha town and



opened their first cereals shop, with their inaugural products being green grams, rice, groundnuts and popcorn.

The shop has since been relocated to Kinamba Shopping Centre.

One of the products launched in 2019 at the Youth Fund is the agri-biz loan meant for Kenyan youth who wish to start or expand agricultural related businesses, including working capital and purchase of equipment. The loan is available to individuals, registered groups, partnerships and companies owned and run by the youth. No interest is charged on the loan that peaks at Sh2 million (USD 2000).

EagleSight has one year to complete their loan repayment. Youth Fund offers a six-month grace period before the countdown begins. Chairman Joel says they found this manageable and would not hesitate to take another loan if the business needed it.

### 3. GRANT FROM IFAD THROUGH THE VIJABIZ PROJECT

At first, Vijabiz mainly organised workshops and trainings for the 166 shortlisted youth groups, including EagleSight, in Nakuru and Kilifi counties. Applicants were later informed of an opportunity to receive a grant from IFAD through Vijabiz. Stakes were high as only part of the 166 groups would benefit from the financial boost. After receiving applications, mentors from Africa Initiative for Rural Development and Planet Resource Africa (Egerton University), previously selected to offer entrepreneurship training in Kilifi and Nakuru, conducted field visits to each of the groups to verify their eligibility for the project and identify skills and capacity gaps that the project could help address.

The competitive nature of grants demands excellent applications. Adequately equipping rural youth with skills that help them to clearly articulate ideas and present their businesses in the best light is a vital step in ensuring they take advantage of the numerous funding opportunities at their disposal.

It was a thorough application and vetting process and an even more nerve-wrecking year-long wait for the results. The good news came in October 2019. EagleSight was informed that they had been awarded KSh2 million (USD 20,000) to invest in their business as per need particularly for value addition equipment. Part of the money would be released in three phases, with proper account-

ing of the previous allocation being a major determinant of the release of the next installment. The group was assisted by the project for the purchase of equipment. Vijabiz was not taking anything to chance; it organised a financial clinic to further equip recipients with money management skills.

Thanks to the grant, the group now owns a second cereals shop and a posho mill fully equipped with Grade 1 and 2 cereal grinders. The Covid-19 pandemic put a grinding halt their plans to begin supplying schools with grains for their meals. Once things look up, this will be revisited to take advantage of the 80-100 per cent profit margins expected. The ripple effects of the pandemic have negatively affected their sales, but only slightly. Man must eat, so they continue to sell their grains now, including different types of beans, maize and millet. They also retail grade 1 and 2 maize flour, wheat flour and porridge flour (grounded millet, maize, groundnuts and cassava).

Not that there were any doubts, but the rewarding versatility of the cereals value chain has affirmed the decision to switch from horticulture to cereals agribusiness. Members of the group envision a future where everyone of them has a shop to manage as they work towards empowering each other financially.

### Evaluating Vijabiz success in achieving or moving towards achieving the main aim of the programme

*“At the end of the programme, we hope that the groups will be registered business entities, the incomes of the enterprises will have improved, they will have created more employment opportunities for youth, and their enterprises will have grown.”*

*~Eric Bosire, Head of Programs, USTADI Foundation.*

#### • Build entrepreneurship capacity for youth agribusiness groups

Prior to engaging with Vijabiz, EagleSight had little knowledge on agribusiness. Today, thanks to the collaborative project between IFAD, USTADI and CTA they are better entrepreneurs with a wealth of knowledge on how to steer their agribusinesses forward. Some of the skills that have been imparted include financial literacy, book keeping, spotting and applying for financing opportunities, social media for business and marketing. Vijabiz also organises experiential tours where EagleSight and other groups visit

farms doing well. Budding entrepreneurs have a chance to glean and learn from seasoned farmers and businessmen and women.

- **Wealth Creation and Poverty Reduction**

A work in progress, but with great strides nonetheless. The IFAD grant has played a big role in facilitating business scale-up for the group. A second shop earns them more money, resulting in increased income levels for members.

By fully immersing itself in the value addition of their cereals venture, EagleSight has created job opportunities for others along the value chain. These include farmers whom they source their produce from, transporters and people employed to run their two shops.

Eunice Mwangi is a member of EagleSight. When the opportunity arose for a member to be employed to run the cereals shop at Kinamba Shopping Centre, Eunice grabbed it without hesitation. Her job at a hotel in the locale did not offer her the security the group business does. As one of the founding members, she has witnessed the gradual growth of what was once a chama into a registered company.

“Being part of EagleSight has really transformed my life. At 27, I am a shareholder in a company run by visionary youth who will not settle for anything short of success. We push each other to be our individual best selves so we can then give the business our best. I take pride in the fact that I am able to serve the group as an employee and also earn from the hard work we all put in.

“Not only have I had the chance to attend eye opening trainings facilitated by Vijabiz and the county government, I have also become financially independent. I know I can speak for other group members too. I am committed and working to see EagleSight thrive to greater heights than we ever imagined.”

With the above strides in mind, scale-up for Vijabiz Project would involve expanding the project to other needy counties in Kenya. Assessing the overall performance of the funded businesses in Nakuru and Kilifi counties, for instance, is a vital step in either redesigning or improving the project for expansion. Collecting and evaluating data for agriculture is an area that CTA has vast experience in; this information should be handy in evaluating goals,

challenges, needs and other aspects as per project objectives.

To achieve desired reach and scalability, Vijabiz would probably need to seek out more funding partners. Project execution needs money, not just for funding youth agribusinesses directly but facilitating operations too.

### **Lessons learnt by EagleSight Group In their Agribusiness Journey**

- Group dynamics: One of the advantages of operating as a group is that the group benefits from the strengths of each member in making it successful. In case of any differences, a constitution and a leadership council are vital in ensuring civility and adherence to group/company rules and regulations during resolutions.

Members who, for instance, repeatedly fail to remit contributions jeopardise a group's financial and business expansion goals. In the duration of its existence, EagleSight has had to let go of some of the members whose actions did not serve the greater goal of the group. Crops are often pruned of problematic branches or vines in order to increase yield. The same is true for groups. Cohesion is a major recipe for success as far as groups and businesses are concerned.

- Saving: A good financial practice demands that one develops a saving culture. Eaglesight used their savings to advance their dream of getting into agribusiness and the habit continues to date. Savings will cushion the business in case of a crisis. The group recommends that youth find a SACCO or a financial institution that they trust and open savings accounts with them. Chamas can also be a great start.
- Self-initiative: The first step is yours to make. Laziness and complacency will cost one opportunities that they may have been exposed to had they been pro-active. EagleSight's visit to the Ministry of Agriculture for advice placed them on a path of unanticipated growth and success.
- Knowledge: Learning never stops, especially in a dynamic industry such as agribusiness. Attend workshops, trainings and agricultural shows if you can. With some guidance, rural youth can also access a lot of helpful and innovative information using their



mobile devices.

- Market research/analysis is vital: When the group set up its first shop in Naivasha town, they were oblivious of the dynamics involved in selecting a profitable location. A couple of months in, the group realised it was not breaking even as it had set up shop in a locale that mostly housed wholesalers. This meant that as retailers, their prices were slightly higher than their competition. Many customers were also loyal to sellers they had been buying from for a while. Ultimately, a decision was made to move the shop to Kinamba Shopping Centre on the outskirts of Naivasha town where there was little competition. The business eventually picked up and is doing well.
- Loans: The thought of taking a loan can be daunting, but it can also mean the difference between thriving and withering. Do consider the risks, but always pursue what is best for your business. Two things may result from this display of courage; success or failure. Either way one benefits from practical lessons they may not have learnt had they not bet on themselves.

### Opportunities for Funders

- Training: Many more counties in Kenya are in need of programmes akin to Vijabiz. Youth need to be supported with knowledge and educated on the opportunities available for financing their agribusinesses and how they can access them.

Youth also need education for farming best practices in order to minimise losses accrued during production. These include seed choice, fertilisers and climate change. Ultimately, a good yield should mean good financial returns for posterity.

- Many youth are skeptical about loans. They fear that with the uncertainty of yields, they may be crippled by loans that often come with high interest rates. It is imperative that macro and micro finance institutions design youth friendly packages that will encourage young entrepreneurs to trust and accept this kind of financial help.
- Technology: Poor infrastructure still plagues many Kenya's rural areas. Inaccessible roads, lack of electricity and connectivity are some of the challenges that present logistical nightmares as well wishers, stakeholders and industry players seek to reach the

youth in these areas. Infrastructural reforms lay the groundwork on the greater vision of transforming rural areas for the better. Additionally, leveraging on mobile phones/devices for education can keep rural youth in the know regarding trainings and current trends.

- Storage for cereals: One of the major challenges faced in the cereals farming in Kenya is post-harvest losses. Lack of or poor storage contributes to wastage of almost half of the produce harvested. Maize and groundnuts are affected by aflatoxin. Beans are susceptible to pest attacks. These losses eat up a big chunk of profits that would have been otherwise ploughed back into business. Farmers need to be trained on post-harvest management. Proper storage facilities are needed to reinforce the education that the farmers will receive.
- Collaborate with county governments in Kenya to identify gaps, and locations where projects can be implemented. It is important that youth are involved in round tables and decision making. Youth often complain of being overlooked in processes that target their wellbeing. In the end, the implementers miss out on illuminating input right from the horse's mouth.

### Conclusion

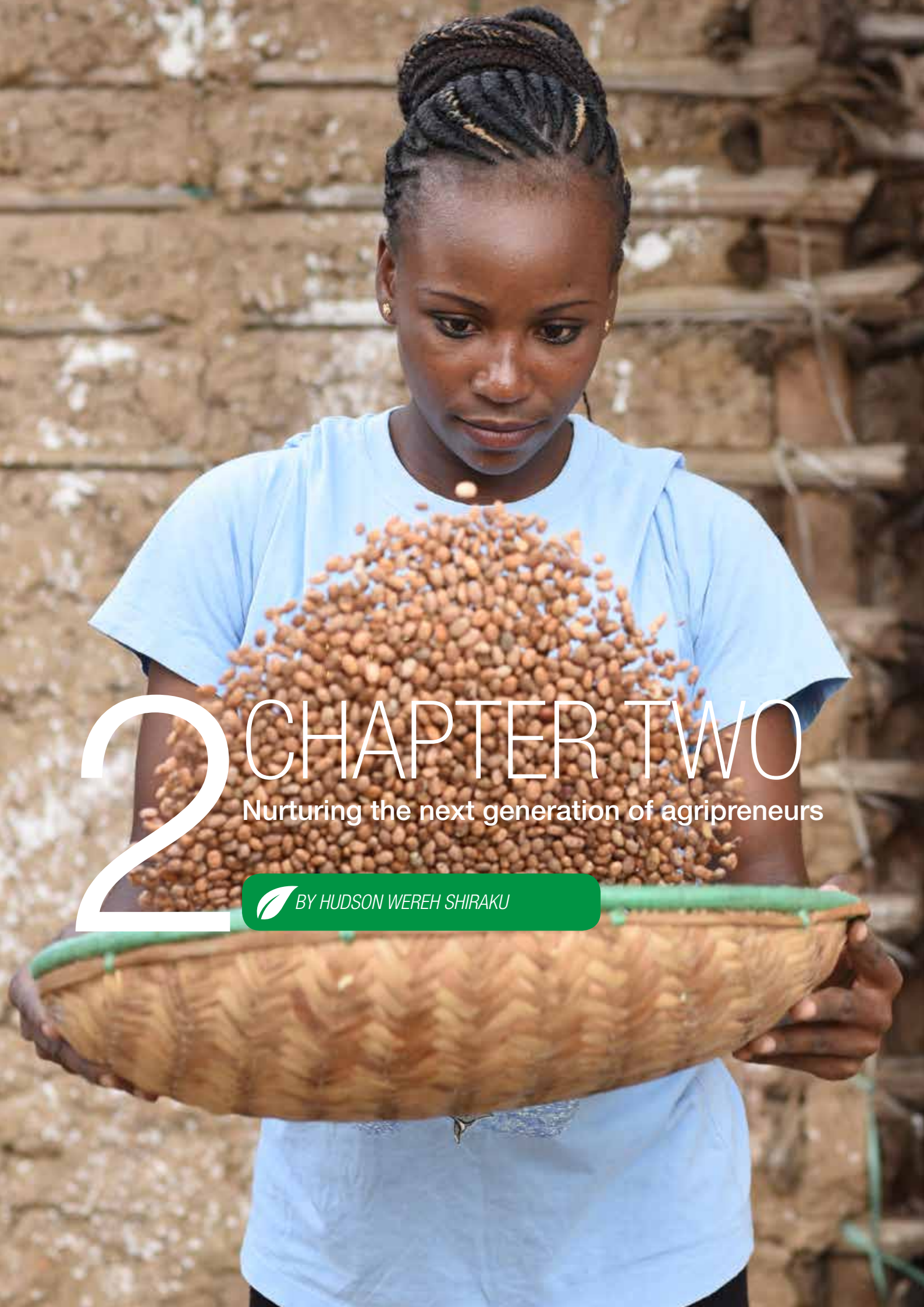
The agricultural sector is arguably the most readily available employer of youth in Kenya. If invigorated, the sector has the potential to mop up every one of the unemployed youth in rural areas and by extension urban areas. There are opportunities in technology to be exploited, life and practical skills to be imparted, production gaps to be closed and markets to be pursued; all these and more on the back of rural youth having access to finances to start and grow their agribusinesses.

[www.fao.org/kenya/fao-in-kenya-at-a-glance/en/](http://www.fao.org/kenya/fao-in-kenya-at-a-glance/en/) "The agriculture sector in Kenya"

[www.ifad.org/en/web/latest/blog/asset/41207683](http://www.ifad.org/en/web/latest/blog/asset/41207683) "How old is the average farmer in today's developing world?"

### About the Author

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# 2 CHAPTER TWO

Nurturing the next generation of agripreneurs



BY HUDSON WEREH SHIRAKU

## CHAPTER TWO

# Nurturing the next generation of agripreneurs

By HUDSON WEREH SHIRAKU

### Introduction

Agriculture is and has always been the mainstay of most African economies. However, the sector remains in the able but now aging hands of senior citizens as the youthful and more energetic population remains unenthusiastic to take over the mantle. This is discomfoting considering that 65 percent of the continent's population, according to the World Bank's report, Agriculture and Food, depends on small-scale farming as the primary source of livelihood. And despite getting support from the government and development entities, small-scale farmers still struggle to even feed their families due to negligible proceeds from farming. This has consequently dissuaded the youth against embracing agriculture, a factor that now threatens the sector's ability to feed future generations.

### Background

Over the years, support channeled into agriculture has largely been for "just farming"— meaning growing crops and raising livestock only. But this is a fallacy, considering that only less than two per cent of agricultural employment opportunities are on farms. There exist a myriad of opportunities directly linked to agriculture, including food manufacturing, financial planning, lending, insurance, commodity trading, and natural resource management. Therefore focusing on production without giving it the value chain approach does not yield optimum benefits. In essence, agribusiness may not be the magic bullet needed to fix all the shortcomings faced by farmers, but it is a solution to many challenges. And as one farmer aptly observes, "farmers need to make money from farming in order to sustain themselves and entice young people into the trade as is the case with other industries".

The art of management of the agricultural business is what is referred to as agripreneurship and lately, there is increased momentum in the promotion of this approach. Various organisations and programmes are increasingly focusing on accelerating economic growth through the exploitation of opportunities across different agricultural value chains. One such programme is the Youth Economic Empowerment through Agribusiness in Kenya (Vijabiz). A coinage of two Kiswahili words "Vijana", which means youth and "biz", slang for business, Vijabiz literally means "youth in business". The project, as the name suggests, is aimed at creating sustainable employment



for the rural youth through active engagement in agribusiness for wealth creation and poverty reduction. It is a joint project of the Technical Centre for Agricultural and Rural Cooperation (CTA) and the Kenya-based USTADI Foundation. The project seeks to build entrepreneurship capacity for the youth and offer financial support.

## The Project Design

Vijabiz is primarily designed to build and strengthen sustainable youth-led enterprises. As per the project design, this is executed through collaboration with innovative financial service providers, creation of market linkages, integration of digital technologies, and the improvement of the capacity of the youth in business management. To achieve this mandate, the project has been designed to undertake interventions along the following nine thematic areas:

- 1) Access to finance for youth in agribusiness
- 2) Business mentorship for young agripreneurs
- 3) ICT and social media for youth in agribusiness
- 4) Market linkages for young rural agripreneurs
- 5) Access to information
- 6) Access to land for youth agriculture/agribusiness
- 7) Policy support for youth agripreneurship
- 8) Climate change and youth agripreneurship
- 9) Young women and agribusiness

## The Beneficiaries

A total of 166 groups comprising of 2,373 members from the counties of Kilifi and Nakuru have so far benefited from the programme between 2018 and 2020. The beneficiaries are drawn from both private and public sectors involved in the three value chains of dairy, cereals, and fisheries. Service providers in Information Communication Technology (ICT), as well as business development, are similarly beneficiaries. However, the direct beneficiaries during the 2018-2020 period are youth-led agribusinesses dealing in cereal, dairy, and fishery value chains in the two counties. The groups were selected through a competitive process and provided with capacity building and financial support.

## Project Milestones

While the sharing of success stories is inspirational, it can be a very tricky affair among some groups. Among the populous Luhya community of Western Kenya, for instance, self-praise or bragging is frowned upon. One hardly parades or publicises their achievements as this can be misconstrued as arrogance. This is the down-

side of an otherwise positive trend geared at promoting humility among the Luhya, considering that sharing of success stories is a crucial learning process. It also offers an opportunity for one to appreciate other examples elsewhere and thereby inspire and boost one's efforts.

There is no denying that the sharing of success stories today helps in nurturing the next generation of agripreneurs and creates a multiplier effect. The highlights of the successes of the Vijabiz project, for instance, demonstrate the project's positive impact on two youth groups in Nakuru County – Greenbelt Youth Group and Greenthumb CBO. This moving tale can inspire other youths to replicate similar efforts across the country. There are indeed many organisations willing to inject millions of shillings to assist the youth start businesses to transform their lives. And access to the many available success stories can particularly help them to reinvent the wheel by learning from others and even performing better.

## Greenbelt Youth Group

### From Football to a Youth Group

They started off as teammates at the Greenbelt Football Club where they routinely engaged in competitive matches at Afraha Stadium in Nakuru town. Like most soccer talented youths across Africa, David Muchiri, Josephat Gachomba, and Peter Mucheru were optimistic soccer would hand them a direct ticket to the trendy and lucrative football leagues in Europe.

The trio hoped some soccer scout would spot them and catapult their sporting career to international stature. After the long wait with nothing coming through, David, Josephat and Peter had to think of a venture through which to earn an income. Then, most young people in their locality on the outskirts of Nakuru town in Dondori – a rural area bordering Lanet and Nyandarua County – were venturing into boda-boda (motorcycle taxi) business. However, the trio saw a greater opportunity in buying milk from the neighbouring Nyandarua County and supplying to clients in Nakuru. They accordingly bought motorbikes for ferrying the milk to clients. This enabled them to earn some money to support their football activities as well as their families. But their needs quickly surpassed their incomes and with time their dream of joining the European soccer stardom equally faded away.

Determined to make ends meet, alongside 11 others, David, Josephat, and Peter formed the Greenbelt Youth Group to help them pool resources and focus all their energies on the milk business. And there is a fairly ready

market, considering that Nyandarua County is home to large-scale dairy farmers and Nakuru is a fast developing town with a huge urban population.

## Challenges

With the formation of a formidable business group of 14 focused and dedicated members, victory was almost guaranteed. They bought two old freezers to store milk for a longer period as they supplied the valuable liquid to clients and also opened up milk kiosks across Nakuru. With these investments, all was set for a brighter future for the youngsters in their milk business. However, it turned out that these were mere wishes as all was totally not rosy.

Milk consumers still opted for packaged milk with big brands. And because the group did not have enough financial resources to invest in quality milk processing equipment, members suffered frequent huge losses. They also lacked the requisite skills for running a business and although they worked hard, their profit margins remained low. The situation was worsened by their occasional temptations to eat into their capital, thereby destabilising their income. So ideally, while milk continued to flow from Nyandarua, they were unable to convert this liquid into money, which they desperately needed to change their lives.

## Vijabiz Interventions

When it gets darkest, they say, the stars come out, and members of the Greenbelt Youth Group understand this adage better. Just when they were at the point of throwing in the towel, they encountered Vijabiz which came to their rescue. The project was recruiting competitive and visionary youth groups and supporting their agribusiness ventures. As expected the David-Josephat-Peter ex-footballing trio and colleagues seized the opportunity and submitted a well-thought-out proposal that saw them join the long list of other beneficiaries.

Thanks to Vijabiz, the Green Belt Youth Group was equipped with a pasteuriser, a chiller and a generator for their milk enterprise. The types of equipment, the group stated, were most crucial yet expensive to purchase owing to their small-scale earnings. Upon receipt of the equipment, rejuvenated team members happily set up the dairy processing machine and prepared their business premises, including placement of floor tiles, partitioning of rooms, and painting the walls and ceiling white as per the government requirements for such food facilities.

The team also benefited from important training sessions that have helped them to transform their business. Members have acquired skills in business and entrepreneurship, the use of ICT tools to promote their business, experience capitalisation, dairy management, growth strategy and development as well as business plan development. Members have accordingly learned to keep proper financial records, which in turn has helped them to lower their operating costs. They have, for instance, opted to sell their milk at USD 0.5 a litre, USD 0.1 lower than the market price. This has led to increased sales.

Were it not for the intervention of Vijabiz project, members of the Greenbelt Youth Group concede they might have never pulled through the mess they initially found themselves in. Having received material help and accessed crucial training, they are now back on track and confident about establishing a sustainable dairy enterprise.

Support from Vijabiz has rekindled hopes of the one-time group of footballers of owning a milk processing plant and getting Greenbelt branded milk into shops and supermarkets across Nakuru County and beyond.

And they are only a few steps away from this dream. All they need now is a homogeniser, packaging machine, preservatives and cream remover to be able to undertake all activities of a modern milk processor. They are working on setting up accounting infrastructure, buying a computer, developing a website, registering a company, and finally acquiring a Kenya Bureau of Standards (KEBS) certification.

According to the group's vice-chair, Josephat Gachomba, he and other officials aspire to support the project and transform the youth group into a dairy company: "Every group member is committed to the cause and we will soon have our milk in all nearby shops and supermarkets."

## Greenthumb CBO

### Venturing into fish farming

Not far away in the same Nakuru county is another group, Greenthumb Community Based Organisation (CBO), whose members are engaged in fish farming in Manyani area. Traditionally, the native residents of Nakuru, in the Rift Valley region, are neither fishermen nor enthusiasts of the fish delicacy, but members of Greenthumb settled for the fish farming venture after unsuccessfully trying other options. In fact, they were persuaded into embracing fish farming particularly following a spirited publicizing of aquaculture

by the local government as an alternative agribusiness opportunity to the already flooded traditional agri-ventures in the county. There was a problem of overfishing in Lake Naivasha and the authorities were promoting aquaculture as a means of easing pressure on the lake.

“We know the problem we have in illegal and overfishing and we can only end this by creating alternatives for them,” observed Ms Immaculate Maina, the County Executive Committee (CEC) for Agriculture. Despite lack of knowledge and experience in this area as well as resources, the group accordingly grabbed the opportunity to venture into fishing.

Previously, the 28-member CBO was engaged in the farming of crops such as maize and snow peas. They also used to prepare and sell food to factory workers in Nakuru’s Industrial Area. They would then donate about 50 percent of the proceeds to families of children with disabilities. However, the venture was unable to sustain the group hence the shift to fish farming. But fishing proved a disastrous experiment for members, who were on the verge of opting out when the Vijabiz project intervened.

### Challenges facing fish farmers

Despite the hype created around fish farming as an opportunity in non-traditional fish farming counties like Nakuru, there are still no supportive infrastructures to nurture startups.

Members of Greenthumb started fish farming with the intention of empowering themselves and establishing individual projects. However, most of the members changed their minds when the group project failed, and the entire investment was lost. Like in many startups, they lacked the necessary guidance, market experience, and the knowledge to take it to the next level.

The group also lacked mentorship and leadership to inspire members in making the right decisions. They had brilliant ideas but lacked the relevant experience to get their fish from harvest to the market. This, coupled with a lack of training in the management of fishponds, led to poor handling of harvests and huge losses to the point of despair. The group lost half of its members as a result. And Nakuru being a heavily agricultural area, the ponds faced a greater risk of agrochemicals pollution which could kill the fish.

Other challenges included low productivity, limited supply of fingerlings, limited quality feeds, and poor market access. And because the entire fishing project is reliant on water from seasonal rivers, prolonged droughts pose an additional challenge. This makes it difficult for fish farmers to maintain a flow of freshwater that is habitable for the fish.

Nakuru’s Fish Farming Coordinator under the County Director of Fisheries, Mr. Kahareri Kiarie, explains that the soils in Nakuru County are porous and do not retain water for long. Farmers, therefore, need to buy a wall lining for the ponds, which costs at least Sh10,000 – a fairly expensive undertaking for small holder farmers. Lack of information on fish farming, adds Kiarie, has largely contributed to low production. The county official advocates the need for more training and the linking of new farmers with skilled personnel.

### Vijabiz Intervention

Help from Vijabiz could not have come at a more appropriate time. Its intervention boosted production for the group, following members’ training on fishpond management and introduction of a technology that enables them to monitor ponds with a view to determine the water quality and health of the fish.

Members of the group say they learned of the Vijabiz project through the officer in charge of fish farming in Nakuru Country. The group has greatly benefited from the project’s interventions, especially with regard to access to finance, mentorship, and training in ICT.

“Through the Vijabiz project, we were linked to financial service providers and won a grant of over KSh500,000 (US\$5,000) and equipment worth over KSh1 million (US\$10,000). We were also guided on which areas to focus on and this restored hopes of many group members who had given up on fish farming,” says the group’s Chairman, Mr. James Mwangi. He explains that training the youth in ICT and social media for agribusiness was key in activating and guiding members on business engagements on social media platforms.

“Finally, we would not have succeeded to get back to business without adequate knowledge and information. We took the learning tours seriously and met stakeholders with whom we exchanged ideas and learned more about setting up fishponds. The lessons learnt were greatly instrumental and I can confirm today we are at a very different level,” he concludes.



There are many things members say they did in managing affairs of the group that seemed normal and obvious but discovered just how wrong they were after undergoing mentorship and training sessions. They were trained in fish feeding as well as group dynamics and had an exposure trip to Sagana for practical training on pond and fish management.

“Frequent interactions with officers from the Fisheries department kept us informed and properly guided on the goings-on in the fish value chains. We had one-on-one sessions on our business progress with the mentors twice a month for one year,” recounts Mr. Kiarie. The group’s Chairman further observes the leadership skills acquired from the entrepreneurship training, have enabled him to steer the group to greater heights. Group members, he says, no longer disagree about money matters – thanks to the Vijabiz mentorship programme.

Chronology of Events by the Group in the Vijabiz Programme;

1. The first ‘Meet-the-Stakeholders’ forum: It is in this forum that Greenthumb first became aware of the type and amount of the information and knowledge they needed, as well the professionals they could reach to expand their vision.
2. Trip to the National Aquaculture Research Development and Training Centre, Sagana: Two of the members of Greenthumb CBO attended a two-day training at Sagana where they acquired a lot of information on value addition, pond construction and feed formulation.
3. As a result of this day trip, the CBO’s members started the development of their aquaponic and fish value addition project that is now underway.
4. Greenthumb now has a fishpond stocked with 1,000 mono-sex tilapia and six aquaponic plant stations.
5. The members attended the Nakuru ASK Show and the Vijabiz Nakuru East Trade Fair at Kagoto Youth Polytechnic.

## Lessons and Recommendations

1. While the Greenbelt Youth Group has greatly benefited from the support of Vijabiz, the group’s business is far from being self-sustaining. And with the Vijabiz project winding up its activities, it will take members’ serious dedication to stand on their own feet and move on. The group has nonetheless exhibited some attributes of business resilience – thanks to

the capacity building training members underwent. Ideally, the groups without the capacity to stand on their own risk stalling. It is therefore recommended that a strong support system of various stakeholders in the sector is assembled with a view to supporting each other.

2. Many entrepreneurs lack relevant business mentorship, an essential ingredient in developing and scaling up their enterprises. Vijabiz’s intervention has therefore been very useful and it is hoped the national and county governments, as well other stakeholders, will continue to offer the necessary support to fill up the gap resulting from Vijabiz’s exit.
3. Since there are many actors involved in supporting agribusinesses, there is a need to create a multi-stakeholder platform for sharing success stories and challenges with a view to promote learning from each other and to avoid duplication of efforts.
4. Finally, despite publicising the Vijabiz the project, some youth seemed unaware of its existence. There is, therefore, a need to create massive awareness of existing organisations and interventions that support agribusiness among the youth.

## Further Readings

<https://ourworldindata.org/employment-in-agriculture>  
World Bank Report; <https://www.worldbank.org/en/topic/agriculture/overview>  
Nakuru County Website; <https://nakuru.go.ke/departments/housing-sectors/>

## About the Author

**Hudson Shiraku** is an environmentalist and an ICT4D consultant in the development sector. He is a trainer, researcher and project manager with a focus on sustainable agriculture, youth in agriculture, project monitoring and evaluation, climate change adaptation and mitigation strategies, Environmental Impact Assessment and audit. Hudson is currently managing an online farmer information platform called Infonet-Biovision [www.infonet-biovision.org](http://www.infonet-biovision.org) at the Biovision Africa Trust [www.biovisinafricatrust.org](http://www.biovisinafricatrust.org). His email is [HUDSON\\_WEREH@HOTMAIL.COM](mailto:HUDSON_WEREH@HOTMAIL.COM)



# 3 CHAPTER THREE

The power of market access and linkages,  
information in boosting farming among the youth

 By COSETA MACHARIA

## CHAPTER THREE

# The power of market access and linkages, information in boosting farming among the youth

BY COSETA MACHARIA

### Introduction

The benefits of agriculture has been greatly recognised recently. This has been demonstrated by international donors, non-governmental organisations (NGOs) and government development programmes to engage in activities that motivate youth participation in agriculture and lead to economic growth. Youth participation in agriculture is low. The youth have not been willing to participate in farming either as a form of employment or as a key component of improving their livelihood (Mathivha, 2012). Youth involvement in economic activities is mainly driven by unemployment, high poverty levels and inequality between youth and the old. (Swarts & Aliber, 2013). This paper discusses the importance of market access and how the Vijabiz project tried to address this for the youth.

In sub-Saharan Africa, agriculture dominates over other sectors, and it has significant development potential, including creating employment opportunities, raising income and eradicating poverty among the rural youth (CTA, FAO, and IFAD 2014). The sub-Saharan African countries generate a big proportion of their Gross Domestic Product (GDP) from farming. Just as agriculture has untapped potential, the youth also have unexploited potential.

The major constraint contributing to less participation of the youth in agriculture is lack of adequate resources. High remuneration from farming and access to resources needed would trigger the youth to undertake agriculture.

The Youth Economic Empowerment through Agribusiness in Kenya (Vijabiz) programme was initiated in Kenya with an attempt to address unemployment among the youth. The programme attempts to improve market linkages and access to information/education for young smallholder



farmers through capacity building among the youth. This is done by giving youth groups financial skills and support, entrepreneurship and value addition skills, benchmarking and linking them to other actors in agriculture, including the Ministry of Agriculture, Livestock and Fisheries, business and agriculture consultants, among others.

### **Foundation of the program**

Vijabiz was co-founded by Technical Centre for Agricultural and Rural Cooperation (CTA) and USTADI Foundation with the aim of addressing unemployment among the youth in Kenya. It is largely funded by the International Fund for Agricultural Development (IFAD) and targets youth groups engaged in agricultural activities in the rural areas of Nakuru and Kilifi counties. The project is focused on building entrepreneurship capacity, facilitating digital innovation use, creating market linkages and facilitating value addition for youth groups in the cereals, fisheries and dairy value chains.

The main goal of the project is to raise the level of income and eradicate poverty among rural youth in the two counties. This was to be achieved by promoting an active engagement in agribusiness as a form of self-employment. Specifically, the project targeted to support and scale up youth agribusiness in Kenya, with a spill-over into other African countries.

### **Access to information and education**

Despite the existence of a direct link between food security and education, it has been proved that basic literacy skills contribute to improved farmers' livelihoods (FAO, 2007). Youth's access to appropriate knowledge and right information at the right time is an important strategy for addressing the major challenges they face in agriculture and in their lives. FAO/IFAD/WPF (2015) contend that investing in trainings for the youth in the rural areas is of great benefit to the community and the nation at large.

Formal education provides young people with basic literacy skills that can help them carry out day-to-day activities conveniently. On the other hand, non-formal education gives the youth more specific information and knowledge that help them in their decision making. This education is more practical than it is theoretical and presents real life situations.

Capacity building and development is a vital source of knowledge and information. It gives one the ability to per-

form functions more precisely, appropriately, effectively, efficiently and sustain such ability over time (UNESCO, 2006). Access to appropriate knowledge or information is a major component in scaling up agriculture among the youth, and plays a pivotal role in business existence and persistence.

Some of the biggest barriers to access to appropriate information are lack of social networking, ignorance, poor information infrastructure, poor network in rural areas and high poverty levels. These barriers can be broken through training and mentorship programmes on agriculture, well developed information infrastructure, improving connectivity in rural areas and developing software and mobile phone applications to create a platform for affordable access to market information, and wider social networking.

### **Market access and linkages**

Market access in agriculture is the ability to acquire agricultural inputs and services, and the capability to deliver produce to buyers at right time and place (IFAD, 2010a). Market linkages and access is one of the key drivers for rural agribusiness. The market access component in scaling up agriculture among the youth makes a strong foundation for business survival. Farmers should have ready market to sell their produce rather than producing first then searching for the market. (Lundy, Ostertag & Best, 2002: 19).

Markets provide the opportunity to fight against food insecurity. It motivates producers to meet consumers' demand specifications in terms of quantity and quality (van Schalkwyk et al., 2012). In order to raise incomes for smallholder farmers and reduce their poverty level, sustainable market access is crucial. In reaching the market with their agricultural products, the youth rarely enjoy the economies of scale because they farm in small scale. This calls for collective initiatives among the youth to enhance their capabilities to produce in large quantities and enjoy economies of scale.

With the right market access, the youth can easily raise their income levels, reduce poverty and fight food insecurity.

### **Barriers to market access**

#### **Lack of social capital**

Social capital consists of productive social relationships. People without social networks are unable to easily ac-



cess productive information concerning markets. This results in products not needed in the market at that specific time and leads to losses. Lack of social networks implies lack of market linkages, hence low sales.

### **High transaction costs**

Transaction costs are costs incurred in searching for markets, those related to choosing the best market among the alternatives, bargaining and monitoring costs. When high transaction costs are higher than the benefits, this results in a loss.

### **Poor infrastructure**

Farmers need well developed transport and communication infrastructure to easily access markets for their produce. People in remote areas with poor infrastructure are unable to conveniently access markets. Poor infrastructure therefore increases transaction costs, leading to losses or low profit margins.

### **Low bargaining power**

Bargaining/negotiation is the process of parties in a transaction reaching an agreement on their terms of engagement. Small-scale farmers have low bargaining power because they are not capable to produce in bulk

and have poor access to market information. This condemns them to low prices for their produce.

## **Factors that facilitate market access and linkages**

### **Improved infrastructure**

Proper market functioning is a product of improved infrastructure, mainly transport and communication (IFAD 2011). Improved transport system enhances market access, while better communication leads to proper access to market information. Proper market information enhances improved level of market access and linkages.

### **Contract farming**

Contract farming is where a farmer produces to meet consumer specification in term of prices and quantities. Producers and consumers have a formal or informal agreement prior to the production. Contract farming for smallholder farmers reduces risks(Pierre B 2018). It is an assurance of ready market. It is a major form of long-term investment, especially in the case of large-scale farming.(Shepherd A 2007).

### **Social capital and networking**

Networking is a form of social interactions and interper-

sonal relationships. There are various types of networking, including bridging, bonding and linkages. Networking is a great source of market linkages. Proper institutions in the agriculture sector enhances efficient flow of market information, which improves market access. Poverty reduction and growth promotion are major impact of market supporting institutions. (world 2002).

### **Support for collective action/cooperatives**

Collective action promotes production in bulk, hence easy access to markets. Social capital is inbuilt in collective action. Collective action enhances easy access and flow of market information among various actors.

## **Research Methods**

### **Study area**

The study was done in Nakuru County, Kenya. This study area was chosen because it was one of the programme implementation areas.

### **Data collection**

The study used purposive sampling method. Data was collected among the youth groups that benefited from the programme within Nakuru County. The study gives a real description of the impact of the intervention programme because it collected first hand information from the main source. Data was collected through interviews.

To assess the impact of the intervention on youth groups in agriculture, before- and after-test research design was used (Johnson 1998). The before-test was the first interview, which assessed the market and information access situation before the intervention.

The same groups underwent after-test assessment to determine the market and information access situation after the intervention. This was to identify any changes in their market and information access as a result of the intervention. Since the study happened after the intervention, the first interview took some time so as to identify the youth market and information access situation before the intervention. During the after-test interviews, the group members commented on how the intervention impacted their market and information access situation.

## **Findings**

Results indicate that most youth groups can now start new businesses, not necessarily in the agricultural sector, and stand out. From the trainings attended, they were

able to learn how to manage a business, how to market and proper record keeping. As a result of the intervention most youth groups (86.7 per cent) admitted they have improved their market and information access. A group was considered to have improved market access if they gave concrete examples. Most of the groups experienced some improvement in market access. However, 13.3 per cent did not improve market access and linkages. It has to be noted that mature groups or groups that have received grants have increased market access and grown more than the others. The improvements entail increased sales volume, more contracts to supply their produce, involvement in value addition, increased number of employees, reduced marketing costs and several ways of marketing.

As a result of the ICT training through the intervention, the youths learnt of new marketing techniques at zero or lower costs. The Mkulima Young platform is of great benefits to the youth as a marketing platform. Tiger Youth Group received an order through social media to supply flour to a school. Through the programme's name (Vijabiz), customers prefer the products of the beneficiaries. The youths have increased their sales volumes. This is an outcome of the new marketing strategies. More groups are currently undertaking contract farming compared to previously before the intervention. Through contract farming the youth produce for the market compared to previously when they were marketing what they had already produced. This is a strategy to reduce risk of losses. Through contract farming, most youth groups have tremendously increased their sales volumes.

Robert Mwangi of Bee My Partner Youth Group says, "Through the trainings we attended we met Inuka Youth Group, which deals with feeds formulation. We contracted them to be supplying fish feeds to us on time. They supply fish feeds to us at a lower cost, enabling us to raise our profit margins. We currently benefit from contract farming, with easy access of the fish feeds."

Lenah of Inuka Youth Group says, "We have been supplying feeds to Bee My Partner Youth Group. This gives us a sure market for our fish feeds, and has increased our sales volume."

The youth groups also undertake value addition to their produce. They also sell various products under one roof to increase customer satisfaction and minimise movements. And instead of using word of mouth to market





their products as they did before, they now tailor marketing to customer needs.

Jacob of Chania Youth Group says, “Previously we were only doing milk production. After capacity building by Vijabiz we are now make yoghurt, which has helped us expand our customer base.”

Through entrepreneurship training various youth groups have undergone transformation. Some groups had never ventured into agriculture until they were trained by Vijabiz. For instance, Tiger Youth Group previously was in entertainment, while Henrok 6 and Greenthumb were football groups. The groups have also expanded their activities, creating more job opportunities, as confesses David of Airstrip Blessing Youth Group: “All our members are currently fully employed. We purchased a boat, which enabled us to expand our fishing activities, hence more income.”

Through field visits and exhibitions, the youth groups were able to improve their access to knowledge and information tremendously.

They also leverage on social media platforms to access market information and reach customers. Tom

of Youth Awake Bunge says, “We have been able to get market linkages through Mkulima Young platform. We post our products and get customers through the platform.”

Hellen from Ten Sisters Women’s Group says, “Despite being a graduate, the project helped me gain extra knowledge on agriculture.”

The exhibitions also enabled the groups to build crucial networks that have helped them to expand their customer and access important information regarding their products.

“We have been closely interacting with the agriculture extension officer within the ward. Through this interaction we accessed information concerning the National Agricultural and Rural Inclusive Growth (NARIG) project,” says Mwangi of Step by Step Youth Group.

## Discussion

Improvement in market access is an outcome of various variables within and without the groups (Barham & Chitemi, 2008). Various factors influence the extent of impact of intervention on market access and linkages. They include;

Level of education – the study found out that level of education is positively correlated with improved market access and linkages. Youth groups whose officials have higher levels of education were easily able to improve their market access situation. The study also observed that youth groups with more learned members had a high chance of improving market and information access.

Type of product – the programme focused on three value chains; dairy, fisheries and cereals. The study observed that there is a correlation between the type of product and the extent of change in market access. Youth groups under cereal and dairy value chains improved their market access by a larger proportion than those in fisheries. Up to 93 per cent of the groups in cereal value chain improved market access, compared to 83 per cent and 50 per cent for dairy and fisheries, respectively.

Age of the group – mature groups were able to improve their market situation more than the newly formed groups. Mature groups improved by 100 per cent while newly formed improved by 73.3 per cent. Experienced farmers often have greater chances to secure a contract at a lower cost (Omit, et. al., 2009) than new farmers.

Gender composition of the group –women-led groups had a lower level of improvement compared to where there was a mixture of both men and women. Most women were found to sell at farm gate prices since they do not own the means of transport such as motorbikes (Mwangi et al, 2015). This is the major hindrance to market access and linkages among women groups.

### **How the Vijabiz project has scaled up agripreneurship among the youth**

The project has promoted youth participation in agriculture. This is depicted by youth groups increasing the level of production, sales and profits. It also promoted youth agripreneurship through proper property rights by assisting the youth groups to acquire property. Some groups were awarded grants, which enabled them to purchase equipment and scale up their production. The programme also helped the youth to access funds.

Through Vijabiz, the youth were able to interact with various actors in the financial sector. Most groups now have access to Youth and Uwezo funds. The program also exposed the youths to potential investors. The youth have also been

able to scale up agripreneurship through contract farming, hence increased output and higher profit margins.

Business mentorship also exposed the youth to important knowledge and information that helped them to reduce their costs and increase profits. This motivates them to participate in large-scale farming. The project also focused on the empowerment of young women to take up agriculture.

### **Challenges encountered when scaling up**

The project only acknowledged three value chains as has been mentioned above, and these were not priority areas for some youth groups. Such groups were therefore forced to venture into other businesses, which were more costly and the time frame was limited.

Some groups were resistant to change due to lack of self-confidence. Some groups take a lot of time to implement new technologies in agriculture, leading to a delay in the realisation of their projected income.

Lack of willingness by some youth to participate in agriculture and live in rural areas was another challenge. Some young people believe that farming is a preserve for the uneducated, hence they are reluctant to take it up.

Delay of grants as expected was also a major challenge. This interfered with the group's plans. The project and external experts involved issued grants with specific guidelines on what the youth groups could purchase, after discussions with them. Some youth groups mentioned that some equipment selected were not their priority of choice to grow in their line of business.

Youth groups in fisheries require extra trainings on value addition to enhance high profitability, for example, Air-strip Blessing Youth Group and Greeethumb CBO.

### **Possible solutions**

The project should be open to agriculture as a whole, instead of sticking to specific value chains. This will help boost the experience of the youth groups in the value chain they are involved in.

Every youth group should be assigned an agent of change to specifically assist them in transforming into more profit generating groups. The agents' main role will be to assist the groups to accept change. The interven-

tion should follow the stages of stirring change. This will help them handle resistance among the targeted groups. Start by changing them from what they believe in. Sharing success stories of youths in agriculture will also motivate youth participation in agriculture.

### Lessons learnt from the Vijabiz project

There are many stakeholders in agriculture willing to help the youth. Young people should therefore make deliberate efforts to take up agriculture so as to benefit from these opportunities.

Youth have also learnt that there are several unexploited opportunities in agriculture, which can lead to gainful employment. One can farm even without owning land.

“We have been in business for a while, purchasing milk from Nyandarua County and selling to our customers. We are not involved in the production of milk but we are really doing well even without a piece of land for production,” says David from Greenbelt Youth Group.

Social media is a powerful tool in marketing agricultural produce. Mkulima Young is a crucial platform used by the youth groups to market their products.

Value addition is a great deal in business. Profits generated from value addition are much greater than at production level. Youths have learnt to invest in value addition and diversify their products as a way of risk mitigation. Robert Mwangi from Bee My Partner Youth Group says, “We sell fingerlings since we have a hatchery, produce fish and sell fried fish, which is a form of value addition.” Currently the youths are producing for a ready market.

Trainings through the Vijabiz programme helped the youth to change their perception on agriculture. The trainings have also boosted most of the groups’ ability to achieve most of their objectives. Most groups have increased their output and profits through the programme.

### Conclusion

Planned change interventions, if properly managed, are achievable. Through training, the targeted groups are able to change their mindsets and achieve positive results. The positive response from the target groups motivate others to participate in such activities. Because of the intervention, the targeted youth groups feel empowered and are capable of taking up more agricultural activities in large scale.

### References

1. Andrew, S. (2007). Approaches to linking producers to markets, agricultural management, marketing and finance occasional paper.
2. Barham, J. & Chitemi, C. C. (2008). Collective action initiative to improve marketing performance; lessons from farmers groups in Tanzania. CAPRI working paper no 74.
3. FAO/IFAD/WPF. Developing the knowledge, skills and talent of youth to further food security and nutrition. Rome, FAO, IFAD, WPF.
4. FAO/IFAD/MIJARC (2012). Summary of the findings of the project implemented by MIJARC in collaboration with FAO and IFAD: Facilitating access of rural youth to agricultural activities. The Farmers’ Forum Youth session, 18 February, 2012.
5. FAO/CTA/IFAD, (2014.) Youth and agriculture: Key challenges and concrete solutions.
6. IFAD (2011). Rural Poverty Report 2011: New realities, new challenges, new opportunities for tomorrow’s generation.
7. Johnson, J. & Daniel, J. (1998). Research design and research strategies: Handbook of methods in cultural anthropology.
8. Lundy, M., C. Ostertag, & R. Best (2002). Rural Agro enterprises, Value adding and poverty reduction: A territorial approach for rural business development. Rural agroenterprise development project paper.
9. Swarts, M. B. & Aliber, M. (2013). Youth and agriculture problems: Implications for rangeland development. African Journal of Range and Forage Science.
10. Muro, P. & Burchi, F. (2007). Education for rural people and food security: a cross-country analysis. Food and Agriculture Organization.
11. Mathivha, O. (2012). Current and emerging youth policies and initiatives with a special focus on links to agriculture; South Africa case study. Pretoria food agriculture and natural resource policy analysis network.
12. Omit, J., Nyahamba, T. & Collough, E. (2009). Factors influencing the intensity of market participation by smallholder farmers. The African Journal.
13. Mwangi, M. M., Ngigi, M. & Mulinge, W. (2015). Gender and age analysis on factors influencing output market access by smallholder farmers in Machakos county Kenya. African Journal of Agricultural Research.
14. Pierre, M. B. (2018). Empowering through collective action. IFAD.
15. UNESCO (2006). Capacity Building: Handbook for Planning Education in Emergencies and Reconstruction. Paris: International Institute for Education Planning.
16. Van Schalkwyk, H.D., Groenewald, J.A., Fraser, G.C.G., Obi, A. & van Tilburg, A., Van Tilburg (2012). Unlocking markets to smallholders: Lessons from South Africa. Wageningen Academic Publishers.
17. World Bank (2002). World Development Report: Building Institutions for Markets. New York: Oxford University Press.

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# 4 CHAPTER FOUR

Enhancing climate change awareness and food security without donor support

 By *STEPHEN MUKUNDI NJAGI*



## CHAPTER FOUR

# Enhancing climate change awareness and food security without donor support

BY STEPHEN MUKUNDI NJAGI

### Introduction

The impact of climate change on social and economic aspects of life in sub-Saharan Africa continues to intensify. Yield losses due to climate change conditions threaten food security. Further, population growth and the demands for development have led to the encroachment of forested and catchment areas for cultivatable land. This has resulted in changes in the hydrological cycle in various ecosystems and deterred the ability of young people to overcome hurdles in agriculture.

This write-up details how the youth in Kuresoi South, Nakuru County, Kenya, were empowered to overcome production challenges. It shows how young people have turned their lives around through tree seedlings and Irish potato seed multiplication in a region that borders Mau catchment area, one of the largest in Africa. This has then resulted in new entrepreneurship ideas and enhanced climate change awareness, contributing to food security.

### The initiative

Approximately 64 per cent of unemployed Kenyans are the youth, most of whom live in rural areas and lack formal education or professional skills. In spite of this, youth participation in agriculture is relatively low because of their poor perception on the practice. Despite being a rural oriented sector, agriculture remains the backbone of the Kenya economy, contributing directly 26 per cent of the Gross Domestic Product (GDP). The sector provides over 40 per cent of employment opportunities in the country but still remains unattractive to the youth. This implies that most Kenyan youth are not fully engaged in the productive economic activities, which puts their dependency index quite high.

Cherokyet Community Based Organisation (CBO) in Kuresoi South, through one of its youth groups – Cherokiet Set Kobor Youth Group – came up with a project promoting climate smart agricultural concepts in a bid to reduce the effects of climate change. Because of their proximity to Mau complex catchment area, the group took up tree seedlings and Irish potato seed multiplication for artificial agroforestry and environmental conservation. “We targeted about 30 youths in Kuresoi South but hundreds are still left vulnerable to the impacts of climate change,” says Cherokyet CBO Chairman Leonard Ngeno.

The group’s main aim was to fight food insecurity in the area while contributing to environmental conservation at the same time. Based on this understanding, Watafiti Consultants, an agribusiness consultancy, capacity building and management firm, engaged Cherokiet Set Kobor Youth Group members and started an eight-month training and mentorship programme aimed at ensuring the success of the CBO’s initiative. The group members were thus trained on building profitable and sustainable enterprises. They were inculcated with business skills, the need for a demand-driven production and value addition for greater profitability. The group chose the two value chains because Irish potato is a staple crop in the area and tree seedlings multiplication is suitable for artificial agroforestry.

### Partnerships and methodology

Kuresoi South was carved out of the larger Mau complex catchment area. Watafiti Consultants’ engagement with the youth group members was a key strategy that facilitated them to own the process, thus enabling full participation. It was then followed by a consultative strategy meeting bringing together a wide range of stakeholders in July 2019. The stakeholders included the Ministry of Agriculture; Nakuru County Agriculture Department; Kenya Forestry Research Institute (KEFRI); certified input providers, which included Osho Chemicals, Baraka Fertilisers, Isinya Feeds and AgriCo East Africa Ltd; Vision Fund Kenya; and Joyful Women Organization (JOYWO), who provided financial services; buyers and off loaders mainly from the surrounding areas as well as the youth group members.

This led to a Farmer Field School (FFS) in August 2019 at Cherokyet Secondary School and selected demonstration farms. The group members were trained on various climate smart agriculture practices that majorly focused

on Irish potato seed and tree seedlings multiplication for agroforestry. The practices learned included conservation methods such as terracing, contour farming, and good use of manure and commercial fertilisers, among other sustainable land management practices. This enabled the group to come up with their ‘own rules’ to protect the environment through tree planting, reduced soil erosion mechanisms and embracing use of improved energy-saving stoves. Ultimately, together with Watafiti Consultants advisories on financial management skills and value addition agribusiness model, this then paved way for the youth group’s first practical implementation of the initiative in October 2019.

### Project implementation

The beginning was not rosy and it rarely is. That however did not dissuade each stakeholder from playing their role in ensuring the successful implementation of the initiative. The youth members embarked on their activities in December 2019 as presented below.

### Irish potatoes seed multiplication

Kuresoi South area has no fixed planting seasons and the crop usually grows any time of the year. This is due to good climatic condition where rainfall is equally distributed throughout the year. The soil is rich in nutrients and the variety planted, ‘Shangi’, matures within three months.

The Cherokiet Set Kobor Youth Group members undertook the following activities as per the implementation schedule;

- They rented 10 acres of land for preparation within the area and, besides that, most of them had at least half an acre field of their own. This was either owned, rented or inherited from their parents/guardians.
- Vision Fund Kenya gave a loan to each member of the group individually, depending on the additional acreage one had. This meant that repayment follow-up and liability was on each member through the group. In case of default, the group was liable.
- Inputs were provided by the certified input companies, according to each group member’s requirement, both for the group field and members’ own fields.
- Local available labour was utilised for the group field. This also included the group members.
- Sorting, grading and packaging of the seeds were done at a centralised point after harvesting.
- Estimated production was calculated at the farm gate both for the group and individual fields. This enabled



the buyers/off loaders to estimate and purchase the produce in the field.

- An expert in agronomy monitored the process throughout to offer advice and enable the members produce at optimal capacity.
- Watafiti Consultants ensured the implementation process went on as planned through timely follow-up. They also undertook the monitoring process throughout to determine the viability of the project.

The results for the group field produce in March 2020 and after the application of good agricultural practices in production of Shangi Irish potato seeds for multiplication, as trained, were as follows:

10 acres		Planted 1 ton per acre	
10 acres		Harvested 8.7 tonnes per acre	
Narrations	Ksh	Euros €	
Total cost of production	900,000.00	8,181.82	
Total sales of Irish seed for multiplication	2,001,000.00	18,190.91	
Net profit for the group	1,101,000.00	10,009.09	
Return for each member of the group after three months	36,700.00	333.64	

These returns do not include the members with own fields. Every member was able to pay back their loan through the group since all incurred individual costs were deducted at group level.

### Tree seedlings multiplication

The following activities were undertaken by the group members;

- The youth group was financed by Vision Fund Kenya and members' own contribution. The amount was used to buy seeds for the seedbed in a process that involved the input providers, KEFRI and Isinya Feeds. The group obtained seeds from matured trees.
- Youth members with their own parcels/fields were given priority to buy the seedlings after they germinated, and an advisory on agroforestry good practices was offered promptly.
- Watafiti Consultants undertook a future return calculation on investment for the members who planted various trees both for indigenous purposes and fruit trees.
- The CBO and other local community members bought the rest of seedlings.

Estimated future returns for selected trees that some group members purchased and planted in their own fields were as follows.

Tree seedlings and returns estimates		
Narrations	Ksh	Euros €
Indigenous average estimated worth after 10 years (Cypress and Pine) of a single tree	13,624.00	104.55
Fruit tree (Case of avocado) estimated average income for one tree harvest per season after two years	9,432.00	72.73

The process of tree seedlings multiplication is still ongoing as trees take longer time to mature, especially for the members who purchased seedlings for their own fields or households. Some aspects of return is explained in the case study in this article.

### Challenges and unexpected outcomes

The initiative faced a few challenges, even though the expected results eventually followed the projected trend. Since the area experiences rainfall throughout the year, transportation of Irish potatoes from the farms faced immense difficulties. Roads were impassible.

Labour, which is mostly provided by family members, is not always mechanised in the area for the Irish potato value chain. This increases the cost of production and leads to time wastage.

The storage facilities for the Irish potatoes after harvest – during sorting, grading and packaging – lacks modern equipment, hence increasing the percentage of post-harvest losses. Research needs to be undertaken for the crop in the area to reduce the effects of pests and diseases in a guided approach and minimise emerging outbreaks as a result of climate change.

Two unexpected outcomes arose during the project implementation. First, the group members easily embraced diversification of value chains. This was manifested while practising crop rotation as a sustainable land management practice after the first harvest. Some members turned to green peas for the next crop planting. Green peas also do well in the area and this will open up an opportunity to enhance their optimal production for the group members. Others, due to small sizes of land, started



keeping poultry with the income generated from the produce. The poultry droppings will be used as manure in the next crop plantation.

Secondly, the Covid-19 pandemic hit during the next potato production. Prices of inputs went up and produce markets were distorted. This signalled reduced income compared to the first production.

### Impact and sustainability

According to Cherokyet CBO Patron Paul Ngetich, if the initiative is scaled up and uptake increased, then a great impact would be achieved since it was evident that the first try was a success. *“It is worth to note that the Cherokiet Set Kobor Youth Group members only produced for multiplication purposes. When scaled up it means they will be involved in production for both multiplication purposes and consumer markets”* he said.

Mr Ngetich said further value addition activities like preparing French fries (mostly for hotels and other small food outlets), packaging, bulking (so as to reduce transport costs) and transportation (by private contractors) would contribute to Nakuru County becoming food secure and hugely reduce the level of youth unemployment in the area. He added that for sustainability, the CBO is forming its own cooperative society where the youth group will play an integral role. The cooperative society will be called ‘Kicher Farmers’ Cooperative Society’ and is set to join the newly formed Nakuru Potato Farmers Cooperative Union, where youth members will benefit from expanded market and enjoy the economies of scale. “We are in the registration process and already have officials in place and the youth group has already taken the lead,” says Ngetich.

After the first Irish potato seed harvest, the youth group recorded an increase in the membership. Some members who are young parents acknowledged that with the income they are getting, they will be able to raise and educate their children well. “I might have dropped out of Standard Seven due to lack of school fees but my son will get a chance to learn smoothly,” says Kiprotich whose child is in Grade 2 at Cherokyet Primary School. “I will also build a better house.”

To enforce its ‘own rule’ of protecting the environment, the youth group keeps the track of how many trees members have planted and liaises with authorities to ensure only the recommended type of trees are planted. The 30 members have already planted 1,500 trees in their homesteads since December 2019. With this, they intend to reduce intense rains and high temperatures as the most hazards for the Irish potato value chain. They also practice suggested environmental practices in their agricultural activities. Terracing and use of natural fertiliser, among others, are now every day activities. Soil erosion has also reduced greatly. Use of improved cooking stoves and less firewood and charcoal has increased tremendously among the members.

### Lessons Learnt

In the process of implementing the initiative’s ideas, there were a number of lessons learnt. First, it became clear that actionable information model can be applied to any value chain, enabling significant agribusiness growth with time. However, the process requires continuous capacity building to the youth group leaders and members, hence a lot of resources. Building trust among youth members and other value chain actors is a process that cannot be forced, but can grow with time as they work together, and as the interactions increase.



It was also evident that the formation and running of youth groups require qualified personnel who can guide the group to ensure quality adherence and consistent implementation of the proposed activities. Qualified experts like Watafiti Consultants can also help link the groups to other stakeholders, including financial service providers, extension services and input suppliers. These personnel ought to have knowledge of the group dynamics and should be able to mobilise resources because the process requires, among other things, the acquirement of business equipment.

In the implementation of the actionable information, the initial selection of a value chain is a major factor in ensuring success. Many key youth leaders and experts should be invited in the initial meetings to give their opinion. This ensures the value chain would be supported and fully owned by them.

During the implementation it was noted that young farmers change their priorities with time. Therefore, there is a need for innovation in the process of produce diversification. Connection to the market is also essential, as it helps the youth members recognise what the consumer wants, enabling them to include or increase the produce.

### A great experience

From the beginning of the process, Watafiti Consultants tried to translate demand forecast and quality standards into actionable information to ensure Cherokeyet Set Kobor Youth Group was able to produce and supply at optimum levels. It was amazing how key stakeholders in the value chain exhibited such extreme synergy, considering it was Cherokeyet CBO's own initiative and there was no donor or government funding. Partnerships should be developed between governments, intergovernmental,

non-governmental and youth organisations for joint environmental initiatives aimed at building the capacity of youth as future leaders and driving forces behind a new climate change regime.

Now we see how 'actionable information' can be used to lobby key stakeholders. In addition, sustainable production and consumption patterns must be promoted and youth supported as environmental champions in their local communities. It was a great experience to assert that indeed youth can play a role in development of their community. Young people are often more willing to adopt new practices and take risks. They can act as a bridge between traditional farming techniques and new technologies, helping to shift food and agriculture systems towards ones that are more sustainable and ready to beat climate change. It is important that they make it in agribusiness to produce what the market needs. It is equally important for them to be part of the solution against potential climate vagaries. In the long run, this will increase the income for households and contribute to curbing food insecurity.

### References

1. Influence of Kenyan Youth's Perception towards Agriculture and Necessary Interventions; a Review: Lucy Karega Njeru et al; 20th January 2015
2. <https://www.researchgate.net/publication/276311865>
3. <http://www.kenyaforestservice.org/>
4. <http://blog.worldagroforestry.org/>

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# 5 CHAPTER FIVE

Effects of women entrepreneurial behaviour on resilience and agrienterprise performance of dairy business in Kenya

 By EDITH GATHUNGU



## CHAPTER FIVE

# Effects of women entrepreneurial behaviour on resilience and agrienterprise performance of dairy business in Kenya

BY EDITH GATHUNGU

### Introduction

In recent years, women have become one of the fastest growing entrepreneurs and important contributors to economic and social development. Sadly, in most developing countries, women's contribution to entrepreneurship is less recognised based on different social and cultural norms. This has resulted in limited studies on identification of women's entrepreneurial behaviours, which are relevant in achieving their resilience and improved business performance (Ashilina et al., 2019).

Women entrepreneurs apply unique tactics in running their enterprises as compared to their male counterparts. This discrepancy is attributed to their difference in personality behaviour and individual goals (Dias et al., 2018). Furthermore, it has been asserted that gender influences entrepreneurial behaviour (Kumar et al., 2016); and as a result, several studies have been conducted to identify dairy agripreneurs' behaviour for both men and women in general, but with a few focusing on women's entrepreneurial behaviour.

In Kenya, empirical evidence on dairy agripreneurs' behaviour is very limited. This is detrimental since identifying and analysing dairy agripreneurs' entrepreneurial behaviours is a guaranteed method of improving performance in the ailing sector whose 2006-2016 milk yield analysis showed a decrease of 8.1 percent, which translates to an annual decreasing rate of 0.74 percent. The achievement of high performance levels and resilience in the dairy sector primarily depends on the women agripreneurial behaviour since they are involved in a majority of activities in dairy farming (Lukuyu et al., 2019). The sector therefore acts as a hub of women entrepreneurs in the country and thus provides a suitable source population of examining the levels, types and effects of women entrepreneurial behaviour.

Dairy entrepreneurial behaviour encompasses:

### 1. Entrepreneurial orientation

This is defined as the entrepreneurial process that reveals how entrepreneurship is undertaken in terms of the methods, practices and decision making processes. The dimensions of entrepreneurial orientation include;

- **Autonomy** – the independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion.
- **Innovativeness** – a firm's tendency to engage in and support new ideas, novelty, experimentation and a creative process, which may result in new products, services or technological processes.
- **Risk Taking** – incurring important capital or making large resource commitments by seizing opportunities in the market place in the interest of high returns.
- **Proactiveness** – taking initiatives by anticipating and pursuing new opportunities and by participating in emerging markets.
- **Competitive Aggressiveness** – a firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position to outperform industry rivals in the marketplace.

### 2. Market orientation

This is perceived as the organisation's culture that most effectively and efficiently creates the necessary behaviours for creation of superior values for buyers, thus, secure the continuous superior performance for the business. Market orientation has

three dimensions;

- **Customer orientation** – requires a firm to understand the potential customer needs, satisfy customers' needs, and continuously create value to them for a sustainable competition.
- **Competitor orientation** – the ability to understand the competitor's short-term strengths and weaknesses and its long-term capabilities and strategies to generate competitive advantage in the organisation.
- **Inter-functional coordination** – the coordinated efforts of an organisation's resources in creating superior value to customers and to generate the cooperation among all departments in the organisation to create superior value for customers.

### 3. Social orientation

This describes the running of a business in consideration of the enterprise's relationship and duty to itself, the government, the community and the environment.

### 4. Future orientation

Future orientation describes the consideration of forthcoming consequences of present actions in the running of a business.

The Kenya's dairy sector faces numerous challenges that are bound to reduce productivity and general performance of the enterprises. Dairy farmers face challenges with regard to quality and unavailability of feeds during droughts, controlling livestock diseases, sources of information, breeding services and accessing credit. Consequently, for dairy agripreneurs to continue enjoying the benefits of dairy farming, they must be resilient to cope with the turbulent environment and capture opportunities that may arise in order to achieve improved enterprise performance (Shadbolt and Olubode-Awosola, 2013).

Being resilient can be described as having a buffer capacity, adaptability and transformability with increasing degrees of change required with each. The buffer capacity allows an agripreneur to be persistent in absorbing shocks. Adaptability is a dairy agripreneur's strategies to survive through shocks, and adapt to and adopt new states when they are needed. Adaptive capacity is concerned with major disturbances that are rare and less expected due to a major change in the underlying environment (Kangogo et al., 2020).





Since buffer and adaptive capacity can only work up to a certain point, when the disturbances caused by highly dynamic environments push a farming system beyond what it can tolerate, transformation becomes the only option. Transformability is the ability of an agripreneur to find new ways of arranging resources when conditions make the current systems untenable. However, there is limited literature on women agripreneurs' resilience and how the resilience moderates the relationship between women's entrepreneurial behaviour and the performance of their enterprises (Kangogo et al., 2020).

Therefore, in line with the above information, this study sought to understand how to scale up women's performance in the dairy sector with regards to resilience and farm performance by acknowledging the types and levels of entrepreneurial behaviour in women agripreneurs. This analysis will therefore set a foundation for development of more effective initiatives that aim to improve women's performance in the dairy sector. This article defines youth agripreneur as anyone aged 18–35 years who is involved in dairy farming.

### **The study**

The study was conducted in Murang'a County in Central Kenya because a majority of households in the area are involved in mixed farming while dairy cattle is the most important livestock in the area. The study population was all the smallholder dairy agripreneurs in Murang'a Coun-

ty who are engaged in production and marketing of milk and its products. The sample for this study were 682 smallholders dairy agripreneurs (480 males and 202 females), specifically the owners of the agrienterprises in Murang'a County with a focus in Gatanga, Kiharu, Maragwa and Kangema sub-counties.

This study adopted a quantitative research design based on cross-sectional farm household survey. Multistage sampling technique was employed to select the respondents because it is widely used for several reasons, including where a sampling frame is non-existent and construction of one may be too costly. Smallholder dairy farmers are widely spread and there is no sampling frame for dairy agripreneurs. Another reason is that the research was time constrained.

Therefore, multistage sampling technique was justifiable, since it enabled the researcher to take advantage of the hierarchical structure of the target population and design. Based on information from the county agriculture office, four of the main milk-producing sub-counties were purposively chosen. Within the four sub-counties, 12 wards were randomly selected and thereafter 682 dairy agripreneurs randomly selected proportionate to the number of households in the four sub-counties.

Before the start of data collection, a research permit was secured from the National Commission for Science,

Technology and Innovation (NACOSTI), which is the legal body mandated to regulate research activities in Kenya. The researcher also sought approval from the County Government of Murang'a's Department of Agriculture, Livestock & Fisheries to conduct interviews. Data collection took place from 4th January to 14th February, 2020. The respondents were informed of the objective of the study and their informed consent was sought. Once the dairy agripreneurs gave their consent, data was collected through personal interviews using semi-structured questionnaires. A quantitative, correlational and explanatory empirical analysis was carried out to identify causal relationships among variables by using a structural equation model (SEM) method.

### Conceptual framework

Seven dimensions of entrepreneurial behaviour constructs (future orientation, inter-functional coordination, competitive aggressiveness, customer orientation, innovativeness, risk-taking and social orientation) were used as the independent variables in the proposed model. Agripreneurial resilience and farm performance were the dependent variables while gender of the dairy agripreneurs was the moderating variable as depicted in figure 1.

### Findings

#### Effects of gendered entrepreneurial behaviour on resilience and performance

This study demonstrated that both male and female youth agripreneurs who were future oriented were more resilient. Youth who are futuristic are more tolerant to ambiguous situations, which enables them to exploit opportunities that may provide them with income in the future. One youth agripreneur suggested that “youths need to be more future oriented, which may aid them to exploit business opportunities that could enhance their agripreneurial resilience.” hence pointing out the relationship between future orientation (FO) and agripreneurial resilience (AR). Consequently, it is important to note that FO as a behavioural attribute is key in enhancing resilience in youth-led agribusinesses.

Inter-functional coordination behaviour negatively influenced performance of women-led agribusinesses. This negative relationship could be attributed to the fact that women contribute more labour force in dairy management and huge family work load, which hinders them from effectively running their agribusinesses. Therefore, the more inter-functionally coordinated a woman is in

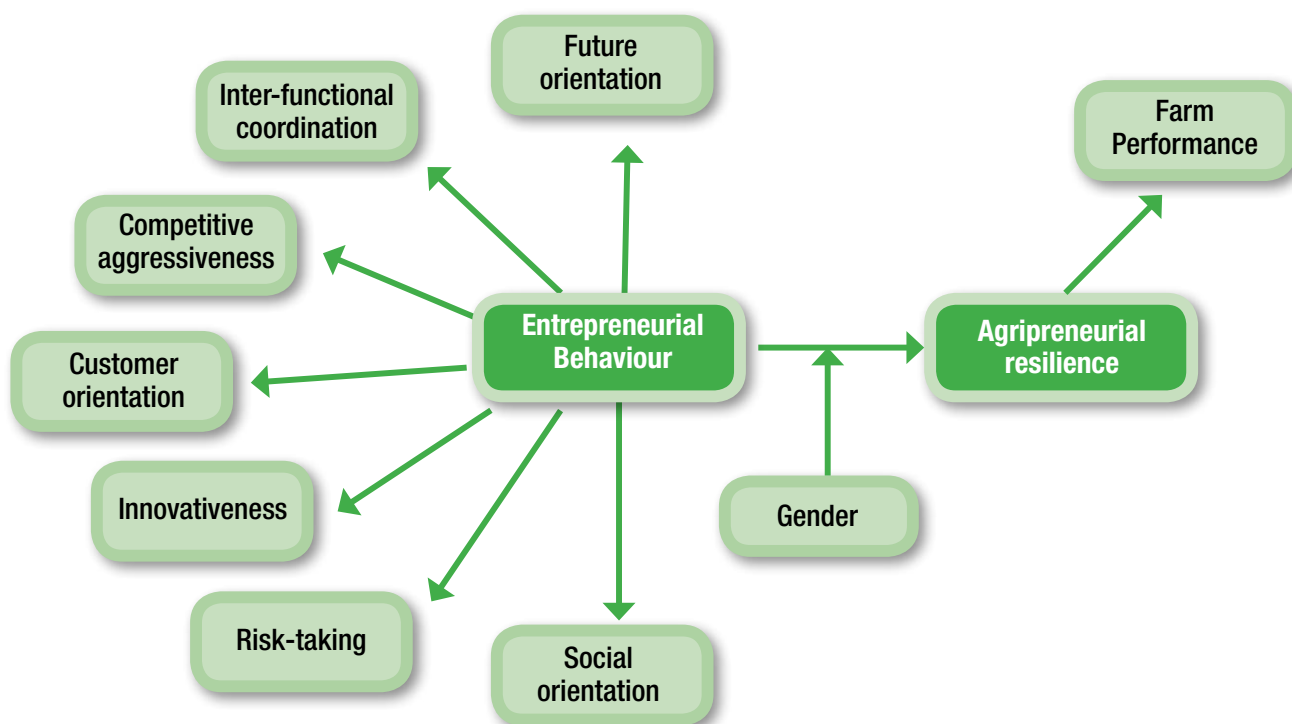


Figure 1. Proposed model for moderating role of gender on the relationship between entrepreneurial behaviour, agripreneurial resilience and farm performance

dairy farming, the lower the level of performance because the woman will have too many responsibilities that will reduce her productivity.

The results indicated that competitive aggressiveness of women positively influenced their agripreneurial resilience. Competitors always pose a threat and risk to the resilience of youth farmers. This study found out that women were intensely and directly challenging their competitors by selling their milk at affordable prices, producing high quality milk and marketing their businesses. Henceforth, since the marketing roles in dairy farming, including competitor identification, analysis and counteraction are predominantly performed by women, the resilience of a dairy agribusiness depends on competitive aggressiveness of women agripreneurs.

The study demonstrated that customer orientation as a behavioural attribute enhances agripreneurial resilience (AR) of male dairy youthful farmers. It is therefore apparent that the skills and knowledge required for customer orientation are also required in resilience. With this debate and results, it is accurate to postulate that an increase in customer orientation also translates to an increase in farmer resilience of male agripreneurs. This is because most of milk marketing is carried out by male agripreneurs.

Male youth agripreneurs' innovativeness is key in improving the performance of their agribusinesses. Innovativeness in the Kenyan dairy sector is expressed mainly through feed formulation, an activity principally carried out by men, with the objective of reducing production costs. However, due to the adulteration of the expensive feed protein sources by fraudulent traders in the country,

the farm-formulated feeds end up causing a decline in production of milk, hence, exploration of innovation by dairy agripreneurs lead to increase in farm performance.

In addition, innovativeness was found to enhance resilience of female dairy agripreneurs. Unlike their male counterparts who innovate to reduce costs, female dairy agripreneurs are forced to innovate to become resilient to the dairy production risks. Some of the innovation initiatives undertaken by the women include formation of table banking groups to enable them access credit and joining of women development groups that enable them acquire livestock, which enhances their agripreneurial resilience.

Risk-taking behaviour was found to be useful in improving the farm performance for both the male and female youthful agripreneurs. Risk taking involves incurring heavy debt or making large resource commitments by seizing opportunities in the market place in the interest of high returns. Primarily, the youthful agripreneurs were taking risks through shifting from low-cost, low-production-resilient indigenous cattle breeds to high-cost, vulnerable, high-production exotic breeds.

Apart from risk-taking behaviour playing a crucial role in improving performance, it was also found that risk-taking behaviour of women may enhance their agripreneurial resilience. This implies that risk-taking ability is a noteworthy factor that makes women agripreneurs more resilient than their male counterparts in managing their dairy businesses. The plausible reason could be due to the empowerment of women, which has awoken their spirit of financial independence and need for success.







A majority of women has limited ownership of resources such as land, capital, and finances and this limits them to engage in entrepreneurial activities. However, women empowerment through involvement in decision-making and control of resources has increased their capability to be more risk-takers, which positively enhances their farm resilience.

Finally, the study found that social orientation reduces the resilience of male agripreneurs. This is intuitive because compared to females, men are less socially oriented, especially in Murang'a County, Kenya. The society has portrayed men in this county as independent and they have to struggle alone to make ends meet. Therefore, the result indicates that if men perceive themselves as more social oriented, the agripreneurial resilience decreases.

### **Comparison between female and male entrepreneurial behaviour**

This article further explores the differences between male and female sub-samples, which revealed that these groups had differences in behaviour. By looking at the specific behaviours, female entrepreneurs are more prone to practising competitive aggressiveness and risk-taking compared to male agripreneurs with regards to resilience. Women agripreneurs are more competitively aggressive than men because conventionally and even in modern times, marketing roles in dairy production are considered as a woman's job, thus women have a better understanding of competitors and are better placed to counteract the competition. Consequently, women beat

men in competitive aggressiveness when it comes to resilience because by having a better understanding of the competitive environment, women are better placed to buffer, adapt or transform in order to minimise risks posed by the competition.

Women are found to be more of risk-takers as compared to men. This is due to the empowerment of women through access to and control of resources, which has increased their desire for financial independence and need for achievement. In addition, due to limited ownership of production resources, women lack the collateral that would have enabled them to engage in agripreneurship and therefore get their finances from other sources that are considered risky such as table banking groups, banks and individuals. However, the more risk they take on in terms of credit utilisation, the more resilient they become because they are now able to fund initiatives that reduce their vulnerability and dependence on men. Female dairy entrepreneurs were also found to display higher levels of innovativeness as compared to male agripreneurs when it came to dairy agrienterprise performance. Women tend to be the higher attendees of most social empowerment programmes where they acquire new knowledge on how to venture into new economic activities, unlike men who rarely create time to attend such forums. This implies that most women are able to access more informational resources, which are likely to influence their innovative capacity, thereby their performance.



## How to scale up women agripreneurship with regards to resilience and farm performance

This article has presented the extent to which gender influences entrepreneurial behaviour (EB) on resilience and agrienterprise performance in the Kenyan dairy sector. It is important to note that women are more competitively aggressive and more risk-takers than men in the development of farmer resilience in the county. Furthermore, women are more innovative than men with respect to boosting farm performance. These findings contribute to filling the knowledge of how gender provides different perspectives of EB practices on resilience and agrienterprise performance. With respect to the results, in order to enhance women agripreneurship, policymakers and developmental agencies need to empower women to be more risk-takers, competitively aggressive and innovative. The first step will be to train extension agents on the three entrepreneurial orientation constructs as most extension agents have low entrepreneurial mindset. Furthermore, due to the lack of ownership of dairy enterprises among women, public and private initiatives that accelerate capital acquisition among women in the dairy sector should be scaled up, both quantitatively in terms of increased accessibility and qualitatively in relation to terms and conditions.

### References

1. Ashilina, H., Baga, L. M., & Jahroh, S. (2019). The influence of farmers' entrepreneurial behavior on the business performance of dairy farmers in west Bandung Regency, Indonesia. *International Society for Southeast Asian Agricultural Sciences*, 25 (2), 143-154
2. Dias, C. S. L., Rodrigues, R. G., & Ferreira, J. J. (2018). What's new in the research on agricultural entrepreneurship? *Journal of Rural Studies*. doi: 10.1016/j.jrurstud.2018.11.003
3. Kangogo, D., Dentoni, D., & Bijman, J. (2020). Determinants of Farm Resilience to Climate Change: The Role of Farmer Entrepreneurship and Value Chain Collaborations. *Sustainability*, 12(3), 868; <https://doi.org/10.3390/su12030868>
4. Kumar, T., Kumar, J., Yadav, R. R. & Kumar, M. (2016). Entrepreneurial Behavior of Men and Women Dairy Cooperative Members in Milkipur Block of Faizabad, District: A Gender Perspective. *International Journal of Bio-resource and Stress Management*, 7(4), 756-760. doi: 10.5958/0976-4038.2016.00122.6
5. Lukuyu, M. N. Gibson, J. P. Savage, D. B. Rao, E. J. O. Ndiwa, N. & Duncan, A. J. (2019). Farmers' Perceptions of Dairy Cattle Breeds, Breeding and Feeding Strategies: A Case of Smallholder Dairy Farmers in Western Kenya, *East African Agricultural and Forestry Journal*, 83(4), 351-367, doi: 10.1080/00128325.2019.1659215
6. Shadbolt, N. M. & Olubode-Awosola, F. (2013). *New Zealand Dairy Farmers and Risk: perceptions of, attitude to, management of and performance under risk and uncertainty*. Centre of Excellence in Farm Business Management Research Report: [www.onefarm.ac.nz](http://www.onefarm.ac.nz).

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# 6

## CHAPTER SIX

Agripreneurs' preferences for climate-smart dairy (CSD) technologies in Kenya



By *DICKSON OTIENO OKELLO*



## CHAPTER SIX

# Agripreneurs' preferences for climate-smart dairy (CSD) technologies in Kenya

BY DICKSON OTIENO OKELLO

### Introduction

Agriculture is one of the key sectors creating employment opportunities and generating income among youth in Kenya. The sector is however the most vulnerable to impacts of climate change and extreme weather events. Heightened temperatures and change in precipitation patterns have steered the sector towards reduced suitability of agro-based enterprises; reduced productivity of crops and livestock due to temperature and water stresses; and rising production costs. The surge in frequency and intensity of extreme weather events such as droughts, floods and strong winds has triggered loss of investments, incomes and livelihoods, destruction of agro-based infrastructure as well as increased frequency of weather-related disasters. These challenges have prompted the government to recognise the need to develop interventions that make agriculture more resilient to climate change and extreme weather events while minimising its contribution to greenhouse gas emissions.

The dairy subsector, which recently has been attracting many youthful entrepreneurs, has not been spared by climate change, which has had adverse effects on dairy farming productivity and profitability. Kenya's dairy industry is considered the largest in sub-Saharan Africa and it contributes about eight percent of the country's Gross Domestic Product (GDP), with an annual milk production of 3.43 billion litres. The sector also employed many youth, as for every 1,000 litres of milk produced, full-time employment for 77 people in milk production and 3-20 jobs in processing and marketing are created. Therefore, with the ongoing climate change, there is a need to adopt strategies to mitigate greenhouse gas (GHG) emissions, which is the main cause of climate change.

Climate change affects dairy farming both directly in terms of livestock performance and well-being, and indirectly through its impact on quantity and quality of fodder production. Climate change directly affects dairy animals' reproductive and lactation performance, carrying capabilities, rate of gaining weight, morbidity and mortality rates, as well as giving them heat stress and increased exposure to disease and parasite infestation. Milk production and reproductive rate of dairy animals is greatly influenced by air temperature, humidity and wind speed. In Kenya, dairy farming is at great risk since there is much dependence on rain fed forage production, which determines the availability of fodder and pasture as well as natural pasture with little or no supplementation. Although climate change severely affects dairy production, several strategies are available that when adopted can help in reduction and mitigation of those adverse effects.

Climate smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. The CSA aims to achieve three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible. These objectives form part of Kenya's obligation as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC). Climate smart agriculture is therefore an antecedent to the attainment of the national interests of food security, productivity, youth unemployment eradication and improved incomes, while concurrently reducing or sequestering greenhouse gas emissions.

The specific reduction and mitigation strategies in the dairy industry in curbing the effects of climate change are referred to as the climate-smart dairy (CSD) technologies and practices. They have been recognised and their adoption promoted by the Government of Kenya in order to transform agriculture to a low carbon and climate-smart, resilient sector. They comprise technologies, practices and services that when adopted will sustainably increase productivity, enhance resilience to climate stress and reduce GHG emissions since dairy farming too contributes to a certain extent to GHG emissions.

## Climate-smart dairy technologies and practices

### Water-smart

These are interventions that improve water use efficien-

cy. They include:

- **Rainwater harvesting** – collection of rainwater and using it for farming in rain-fed/dry areas and other purposes onsite.
- **Drip irrigation** – application of water directly to the root zone of crops to minimise water loss.
- **Laser land levelling** – levelling the field ensures uniform distribution of water and reduces water loss (also improves nutrient use efficiency).
- **Furrow irrigated bed planting** – this method offers more effective control over irrigation and drainage as well as rainwater management during the Monsoon (also improves nutrient use efficiency).
- **Drainage management** – removal of excess water (flood) through water control structure.
- **Cover crops method** – reduces evaporation loss of soil water (also adds nutrients into the soil).

### Energy-smart

These interventions improve energy use efficiency. An example is;

- **Zero tillage/minimum tillage** – reduces amount of energy use in land preparation. In the long-run, it also improves water infiltration and organic matter retention into the soil.

### Nutrient-smart

These interventions improve nutrient use efficiency. They comprise the following:

- **Site specific integrated nutrient management** – optimum supply of soil nutrients over time and space matching to the requirements of crops with right product, rate, time and place.
- **Green manuring** – cultivation of legumes in a cropping system. This practice improves nitrogen supply and soil quality.
- **Leaf colour chart** – quantifies the required amount of nitrogen use based on greenness of crops. Mostly used for split dose application in rice but also applicable for maize and wheat crops to detect nitrogen deficiency.
- **Intercropping with legumes** – cultivation of legumes with other main crops in alternate rows or mixed. This practice improves nitrogen supply and soil quality.

### Carbon-smart

These are Interventions that reduce GHG emissions. Examples include:

- **Agro forestry** – promotes carbon sequestration, in-

cluding sustainable land use management.

- **Concentrate feeding for livestock** – reduces nutrient losses and livestock requires low amount of feed.
- **Fodder management** – promotes carbon sequestration, including sustainable land use management.
- **Integrated pest management** – reduces use of chemicals.

### Weather-smart

These are interventions that provide services related to income, security and weather advisories to farmers. They include:

- **Climate-smart housing for livestock** – protection of livestock from extreme climatic events (such as heat/cold stresses).
- **Weather-based crop agro-advisory** – climate information-based value added agro-advisories to the farmers.
- **Crop insurance** – Crop-specific insurance to compensate income loss due vagaries of weather.

### Business and knowledge-smart

This is the use of combination of science and local knowledge. The techniques under this classification include:

- **Contingent crop planning** – climatic risk management plan to cope with major weather-related contingencies like drought, flood, heat/cold stresses during the crop season.
- **Financial management** – process of planning, organising, controlling and monitoring financial resources with a view to maximising farm profits and reducing costs.
- **Improved crop varieties** – crop varieties that are tolerant to drought, flood and heat/cold stresses.
- **Seed and fodder banks** – conservation of seeds of crops and fodders to manage climate risks.

With regards to the risks brought about in the agricultural sector by climate change and the availability of mitigation strategies to these risks, the Kenyan Ministry of Agriculture, Livestock and Fisheries in collaboration with the Ministry of Environment and Natural Resources implemented the Kenyan climate smart agriculture strategy 2017-2026. The ministries did this with support from the World Bank, the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) through the Integrating Agriculture in National Adaptation Plans project. However, despite the fact that CSD technologies and practices are known to dairy agripreneurs, their adoption is low.

Therefore, to enhance this adoption, especially among dairy youth agripreneurs, there is a need to find out their preferences for CSD technologies. The crucial information on dairy youths' preferences will be useful to the key stakeholders willing to support youth agripreneurs in making informed decisions in adaptation planning, hence justifying the importance of this study.

## Methodology

### Data

Data for the study was collected from a one-round choice experiment and a survey of 384 dairy youth agripreneurs in Nakuru County in January and February 2020. Interviews questions were semi-structured. To elicit youth agripreneurs' preferences for climate-smart technologies, a discrete choice experiment was conducted. Prior to the experiment, focus group discussions and key informant interviews were done. These entailed discussions with groups of dairy youth agripreneurs, dairy input providers, consultants in dairy sector, managers of farmers cooperatives and government extension agents on aspects of climate change and different climate-smart technologies they are using to mitigate the problems related to climate change. The information from focus group discussions and key informant interviews were used to qualitatively determine the (potential) climate-smart technology attributes that youth agripreneurs were utilising. This information also helped in designing discrete choice experiment cards that combined real and hypothetical attributes of climate smart technologies.

The first attribute was carbon-smart technologies with two-levels; concentrate feeding for livestock and fodder management. The second attribute was weather-smart technologies, which had two options; purchase livestock insurance or construct climate-smart housing for livestock to mitigate against the climate change effects attributed to weather changes. The third attribute, knowledge-smart, included two levels of capacity building in relation to climate change. These included training on using improved crop varieties as feeds for livestock and on seeds and fodder banks. The fourth attribute was business-smart with two levels; contingent livestock planning and financial management. These were technologies related to management of agrienterprise as a business. The last attribute, monthly fee (KSh), which was the amount of money paid for a bundle of climate-smart technologies service provision and had four levels (KSh500, KSh1,000, KSh1,500 and KSh2,000).



Table 1. Climate-smart technologies attributes and corresponding levels

Attributes	Definition	Levels
Carbon-smart	Dairy youth agripreneurs utilising improved feeds in their agrienterprises	1. Concentrate feeding for livestock 2. Fodder management
Weather-smart	Access to livestock insurance and investing in livestock housing that are adaptable to climate change shocks	1. Livestock insurance 2. Climate-smart housing for livestock
Knowledge-smart	Training in management of resources in agrienterprises such as improved crop varieties and fodder crops	1. Improved crop varieties 2. Seeds and fodder banks
Business-smart	Access to technologies that improve the business skills and knowledge of youth agripreneurs	1. Contingent livestock planning 2. Financial management
Monthly fee (KSh)	Amount of money paid for a bundle of CST services provision	1. 500 2. 1,000 3. 1,500 4. 2,000

Twenty-four choice cards were generated and allocated to four profiles so that each youth agripreneur was assigned one profile of six cards. Each card had different attributes of climate-smart technologies options and one opt out option. The discrete choice experiment involved presenting generated cards to youth agripreneurs who were asked to make a choice among the three options 1, 2 or 3 as presented in figure 1. If the youth agripreneurs stated they would not prefer any option (option 'None'), they were further asked to make a forced choice between two alternative climate-smart technologies attributes; an opt-out alternative of 'no utilisation of climate-smart technologies' in dairy farming lacked realism.

Suppose you have a bundle of agribusiness support services provided to you to run your dairy business. Below are three options, each with different attributes. If you were given a choice, which option would you choose?			
Attributes	Option 1	Option 2	Option 3
Carbon-smart	Concentrate feeding for livestock	Fodder management	
Weather-smart	Livestock insurance	Climate-smart housing for livestock	
Knowledge-smart	Seeds and fodder banks	Seeds and fodder banks	I would not purchase any of these plans
Business-smart	Financial management	Contingent livestock planning	
Monthly fee (KSh)	1,500	1,000	
<b>Which option would you choose?</b>	<b>Plan 1</b>	<b>Plan 2</b>	<b>None</b>

Figure 1. Sample of a choice card used in the discrete choice experiment

### **Empirical strategy**

The data from choice experiment was analysed with a Random Parameter Logit (RPL)/Mixed Logit model using the software STATA 16. The model accounted for unobserved preferences' heterogeneity across the dairy youth agripreneurs so that it was possible to get multiple choice sets from the same respondents with unrestricted substitution patterns. Thus, the model allowed estimation of the probability of a dairy youth agripreneur's decision to choose a climate-smart technology.

### **Findings**

#### **Dairy youth agripreneurs' preferences for CSD technologies**

Looking at the use of carbon-smart technologies, the results showed that dairy youth agripreneurs prefer to feed their livestock using concentrates relative to fodder. Present-day high-producing cows are the result of years of genetic improvement programmes and feeding them or grazing them on the available fodder and forage often does not meet the nutritional requirements for maintaining high milk production of dairy cows. Therefore, for the purpose of ensuring high productivity, youth opt to feed the dairy cows on concentrates. Furthermore, due to limited space in smallholder farms where dairy enterprises have to compete for space with homes and crop enterprises, there is often lack of land provision for fodder, leaving concentrates as the source of livestock feed. In addition, formal fodder markets (such as hay markets) are a great challenge to smallholder youth agripreneurs in Kenya.

In relation to the use of weather-smart technologies, the dairy youth agripreneurs were not willing to acquire livestock insurance but preferred climate-smart housing for livestock. The reasons for a low uptake of insurance in the agricultural sector, despite a high level of awareness about the concept in the country are that youth agripreneurs believe that insuring their livestock is not necessary and that only other assets such as vehicles and machinery need insurance. Moreover, most of these youthful agripreneurs think it is possible to manage agricultural risks without acquiring insurance. Furthermore, youth agripreneurs perceive that agricultural insurance does not cover or take care of the whole amount of loss incurred by them. Therefore, they hold the view that it takes a long time to get compensation after occurrence of an incident.

One respondent said, "I do not prefer insuring my livestock because payment of premium is expensive and the compensation process takes long."

Thus, a majority of youth agripreneurs is of the opinion that premiums paid in agricultural insurance are too high. This explains why the youth prefer to incur the cost of constructing climate-smart housing for their livestock in order to mitigate the effects of climate change on dairy production rather than signing up for insurance.

Dairy youth agripreneurs had a negative attitude towards knowledge-smart technology trainings that included improved crop varieties in comparison to seed and fodder banks. This finding is consistent with current publications that found that the age of smallholder dairy farmers in Kenya is positively correlated with their propensity to adopt improved planted forages. This implies that the younger a dairy farmer is, the less likely they are to adopt improved crop varieties as a climate-smart technology. This trend is attributed to the fact that benefits from established fodder are not immediate; therefore, older farmers would be patient enough to invest in fodder and wait to reap the benefits later as compared to younger farmers who are known to favour enterprises with quick returns. This explains their inclination towards seed and fodder banks.

Finally, the youth dairy agripreneurs were positively inclined towards contingent livestock planning as their choice of business-smart technology. This underscores the importance of farm planning in mitigating the shocks attributed to climate change. In Kenya, farmers have a limited access to credit and this makes financial management measures such as taking up of loans to finance production activities during droughts impossible for many farmers. Therefore, many farmers opt to implement contingent livestock planning measures such as feed conservation, crop residue conservation and purchase of fodders from other farmers.

#### **Dairy youth agripreneurs' willingness to pay (WTP) for CSD technologies**

Willingness to pay is the amount of money dairy youth agripreneurs are willing to forgo each month in order to utilise a particular attribute of climate-smart dairy (CSD) technologies. Overall, dairy youth agripreneurs were willing to pay USD 47/month and USD 16/month for concentrate feeding for livestock (carbon-smart technology) and contingent



livestock planning (business-smart technology), respectively. However, the sampled dairy agripreneurs were not willing to pay KSh1, 164.21/month and KSh1, 162.39/month for livestock insurance (weather-smart) and training on improved crop varieties (knowledge-smart), respectively. This underscores the importance of feeding livestock using concentrates, constructing suitable livestock housing, ensuring farmers are trained on seeds and fodder bank and are involved in livestock planning as a strategy to mitigate climate change in dairy agrienterprises.

### **How to scale up dairy youth agripreneurs' adoption of CSD technologies for sustainable employment, wealth creation and poverty reduction**

This study provides evidence on smallholder youth agripreneurs' preferences for selected dairy climate-smart technologies. The preferred technologies for youth dairy agripreneurs in countering risks related to climate change are using concentrates to feed livestock in order to increase nutrients rich in energy and protein, thus supplementing basal diet; construction of climate-smart housing for livestock to protect them from extreme climatic conditions; conservation of seeds of crops and fodders to manage climate risks; and farm planning for livestock to cope with major weather-related contingencies like drought. However, the youth were not willing to pay for livestock insurance and improved crop varieties. This trend is worrying as it translates to the agripreneurs incurring a huge opportunity cost for failing to invest in improved crop varieties such as *Brachiaria* grass that has a larger gross margin than conventional varieties like Napier grass. Furthermore, their negative attitude on livestock insurance impedes them from signing up for

livestock insurance policies that have been modified to cater for Kenyan smallholder dairy farmers.

Therefore, in order to improve the adoption of climate-smart technologies among youth dairy agripreneurs that will boost their farm performance and resilience towards climate change, extension services should review their programmes that are majorly production based and include the capacity building of youth dairy agripreneurs on the preferred climate-smart technologies identified above and provide information on the benefits of taking up livestock insurance. On the aspect of improved crop varieties, in addition to training youth on the various varieties and their husbandry practices, the government and developmental partners should work to provide youth dairy agripreneurs with subsidised seeds of the improved crops as they tend to be expensive. This will enhance uptake of climate-smart crop varieties, which may promote development of youth agrienterprises.

### **References**

- Abbas, Q., Han, J., Adeel, A. & Ullah, R. (2019). Dairy Production under Climatic Risks: Perception, Perceived Impacts and Adaptations in Punjab, Pakistan. *International Journal of Environmental Research and Public Health*, 16(20). DOI: 10.3390/ijerph16204036
- Aizaki, H. (2012). Basic Functions for Supporting an Implementation of Choice Experiments in R. *Journal of Statistical Software, Code Snippets*, 50, 1–24
- Bezabih, T.S (2020). Smallholder Farmers Perceptions and Adaptation Strategies to Climate Change in Ethiopia Review. *Agricultural Research and Technology Open Access Journal*, 25 (1). DOI: 10.19080/ARTOAJ.2020.25.556288
- Bulkeley, H. and Newell, P. (2015). *Governing climate change*. Routledge. 166 pp, ISBN 978 1 138 79570 9. <https://doi.org/10.1111/1745-5871.12200>
- Ericksen, P. & Crane, T. (2018). *The feasibility of low emission*

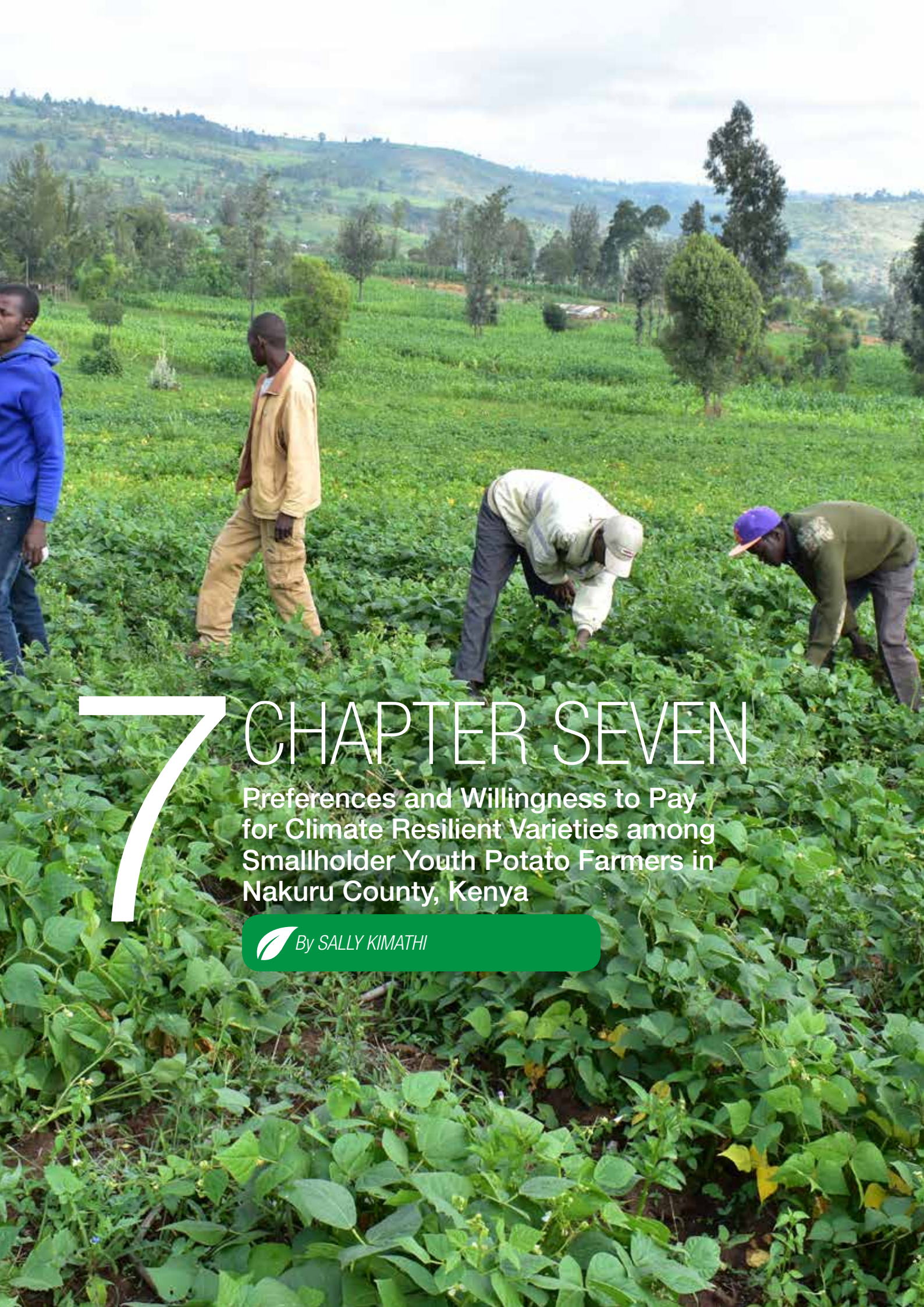


- development interventions for the East African livestock sector: Lessons from Kenya and Ethiopia. ILRI Research Report 46. Nairobi, Kenya.
- FAO & New Zealand Agricultural Greenhouse Gas Research Centre. (2017). Options for low emission development in the Kenya dairy sector - reducing enteric methane for food security and livelihoods. Rome. 43 pp
- FAO (2010). Greenhouse gas emissions from the dairy sector: A life cycle assessment. Rome: Food and Agriculture Organization.
- FAO, (2018). Climate change and the global dairy cattle sector. The role of the dairy sector in a low-carbon future. <https://knowledge4food.net/knowledge-portal-item/climate-change-and-the-global-dairy-cattle-sector-the-role-of-the-dairy-sector-in-a-low-carbon-future>. Accessed 12 September 2020.
- FAO. (2019). Five practical actions towards low-carbon livestock. Rome
- Government of Kenya (GoK) (2017). Kenya climate smart agriculture strategy 2017-2026.
- Kiguru, D., Ateka, J., Mbeche, R & Wamuyu, C. (2019). Attitudes and uptake of agricultural insurance in Trans Nzoia County, Kenya. The 13th JKUAT Scientific, Technological and Industrialization Conference (pp. 207-215). Nairobi: JKUAT.
- Khatri-Chhetri, A., Aggarwal, P.K. Joshi, P.K., & Vyas, S. (2017). Farmers' prioritization of climate-smart agriculture (CSA) technologies. *Agricultural Systems*. *Agricultural Systems*. 151(February 2017): 184-191 <http://dx.doi.org/10.1016/j.agsy.2016.10.005>
- Lukuyu, B. A., Ravichandran, T., Maass, B., Laswai, G., Bwire, J., & Duncan, A. J. (2015). Enhancing livestock productivity through feed and feeding interventions in India and Tanzania (ILRI Project Report). Nairobi, Kenya: ILRI. Retrieved from <https://cgspace.cgiar.org/handle/10568/68753>
- Maina, K.W., Cecilia, N., Ritho, Ben, A. Lukuyu & James, O. Rao (2019). Do farmers benefit financially from adopting improved planted forages: Evidence from. 6th African Association of Agricultural Economists. Abuja Nigeria: African Association of Agricultural Economists. Doi: 10.22004/ag.econ.295711
- Maindi, N. C., Osunga I. M. & Gicheha M. G. (2020). Advancing climate smart agriculture: adoption potential of multiple on-farm dairy production strategies among farmers in Muranga county, Kenya. *Livestock Research for Rural Development*. Volume 32, Article #63.
- Maleko, D., Msalya, G., Mwilawa, A., Pasape, L. & Mtei, K. (2018): Smallholder dairy cattle feeding technologies and practices in Tanzania: failures, successes, challenges and prospects for sustainability, *International Journal of Agricultural Sustainability*, DOI: 10.1080/14735903.2018.1440474
- Michalk, D. L., Kemp, D. R., Badgery, W. B., Wu, J., Zhang, Y. & Thomassin, P.J. (2018). Sustainability and future food security. A global perspective for livestock production. *Land degradation and development*, 30(5), 561-573. <https://doi.org/10.1002/ldr.3217>
- Mwangi, G. H., Karomo, J. N., Kinyanjui, A. M. & Otieno, O. J. (2019). The Effect of Rainfall Patterns on Dairy Farming in Naivasha Sub-County, Kenya. *International Journal of Research and Innovation in Applied Science*. Volume IV, Issue VII. ISSN 2454-6194
- Njarui, D.M.G, Gatheru, M., Wambua, J.M., Nguluu, S.N., Mwangi, D.M., & Keya, G.A (2011). Feeding management for dairy cattle in smallholder farming systems of semi-arid tropical Kenya. *Livestock Research for Rural Development*. Volume 23, Article #111. Retrieved, from <http://www.lrrd.org/lrrd23/5/njar23111.htm>
- Oloo, B. O. (2016). Lessons in sustainable dairy farming to Kenyan dairy sector from the Dutch Dairy Sector. *Journal of Advances in Dairy Research* 4(1):162-172. doi: 10.4172/2329-888X.1000162
- Rahut, D.B. & Ali, A. (2018). Impact of climate-change risk-coping strategies on livestock productivity and household welfare: empirical evidence from Pakistan. *Heliyon* 4 (2018) e00797. doi: 10.1016/j.heliyon.2018.e00797 <https://doi.org/10.1016/j.heliyon.2018.e00797>
- Rojas-Downing, M.M., Nejadhashemi, A.P., Harrigan, T. & Woznicki, S.A. (2017). Climate change and livestock: Impacts, adaptation, and mitigation. *Climate Risk Management*, 16, 145–163.
- Sae-tiao, T., Laodim, T., Koonawootrittriro, S., Suwanasopee, T., & Elzo, M. A. (2019). Tropical climate change and its effect on milk production of dairy cattle in Thailand. *Livestock Research for Rural Development*. Volume 31, Article #194
- Tedesse, G. & Dereje, M. (2018). Impact of Climate Change on Smallholder Dairy Production and Coping Mechanism in Sub-Saharan Africa. *Agricultural Research and Technology Open Access Journal*, 16(4): 556000. DOI: 10.19080/ARTOAJ.2018.16.556000
- Telkewold, H., Mekonnen, A. Kohlin, G. & Di Falco, S. (2017). Does adoption of multiple climate-smart practices improve farmers' climate resilience? Empirical evidence from the Nile Basin of Ethiopia. *Climate change economics*, 08(01) 175001. <https://doi.org/10.1142/S2010007817500014>
- Wekesa, B.M., Ayuya, O.I. & Lagat, J.K. (2020). Effect of climate-smart agricultural practices on household food security in smallholder production systems: micro-level evidence from Kenya. *Agric & Food Secur* 7, 80. <https://doi.org/10.1186/s40066-018-0230-0>

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# 7 CHAPTER SEVEN

Preferences and Willingness to Pay  
for Climate Resilient Varieties among  
Smallholder Youth Potato Farmers in  
Nakuru County, Kenya

 By SALLY KIMATHI



## CHAPTER SEVEN

# Preferences and Willingness to Pay for Climate Resilient Varieties among Smallholder Youth Potato Farmers in Nakuru County, Kenya

BY SALLY KIMATHI

### Introduction

Youth (18-35 years, according to Kenya's Constitution 2010) comprise the most important resource a country can have to boost its socio-economic development and ensure sustainability. However, the bulging population of youth in Kenya, which is currently at 37 percent, still remains a paradoxical situation, presenting both an opportunity and a threat at the same time. A young population is said to be innovative, risk taking and can easily take up new technology. However, Kenya's economy is not creating enough jobs to absorb the growing young labour market entrants. This leaves the vast majority of the young population living in poverty and struggling to find employment, hence deterring progress in boosting economic growth. Youth unemployment rate stands at 17.4 percent, compared to the national rate, which is at 10 percent (Republic of Kenya, 2017). This article ultimately suggests strategies to better encourage youth to engage in resilient potato agribusiness.



Agriculture is the backbone of Kenya's economy, contributing 26 percent of the Gross Domestic Product (GDP) directly and 27 percent indirectly (KALRO, 2017). This makes it a critical sector in creating employment for the growing working age. It is against this backdrop that the agricultural sector has been identified as a potential solution to the youth unemployment problem whose vast majority live in the rural areas. However, this potential is far from being harnessed since only 10 percent of the youth are directly participating in agriculture, according to the Kenya Youth Agribusiness Strategy (2017-2021). This has necessitated the introduction of developmental initiatives to scale up youth engagement in agribusiness.

Modernisation of the agricultural sector in Kenya is important for economic growth and food security and is key in attracting youth to agripreneurship. Introduction of new technology along the potato value chain has made it an attractive and lucrative venture, hence increasing youth engagement in potato farming as a business. Potato (*Solanum tuberosum*, L) is an important food crop in Kenya. It doubles up as a major source of income and a staple food, hence improving the livelihoods of farmers. Young potato farmers are mostly engaged in potato seed propagation, commercial potato production and value addition along the potato value chain. Despite being a key crop, potato farm produce is usually below the potential level at 8-15 tonnes per hectare (T/Ha) against a potential production of 40-50T/Ha (CIP, 2019; Kyamanywa et al., 2011). This problem has been majorly attributed to the adverse effects of climate change and variability in sub-Saharan Africa.

Climate change and variability, characterised by increased temperatures, unpredictable rainfall patterns and prolonged droughts, have been a major setback in the growth of agricultural sector and especially potato farming. The adverse effects of climate change on potato farming include increased emergence of pests and diseases, heat stress on plants, seed rot due to heavy rains and droughts. This has challenged the efforts to scale up youth agripreneurship in potato farming. To address these climate-related risks, numerous efforts and resources have been invested in developing and disseminating improved crop varieties that are adapted to climate change in sub-Saharan Africa (Atlin et al., 2017). In Kenya, the International Potato Center (CIP) has been working with potato farmers in Nakuru County to increase their resilience to climate change using Climate Resilient

Potato Varieties (CRPVs). These varieties are characterised by early maturity properties, tolerance to pests and diseases, heat and drought resistance and high yields. Some of the released CRPVs in Kenya include; Lenana, Wanjiku, Chulu, Nyota and Unica.

Despite such developments, adoption to CRPVs among youth farmers still remains low. Previous studies have attempted to explain this low adoption with factors such as inadequate skills training, lack of quality inputs, land and financial services among youth farmers. However, little emphasis has been put on youth farmers' preferences for the new varieties' attributes. Young farmers have unique needs and therefore their preferences need be put into consideration during the breeding process. The limited coordination between research institutions and farmers may result in sidelining farmers' preferences, especially youth farmers, leading to lower adoption rates (Sánchez et al., 2017). Considering youth farmers' preferences and priorities in the breeding process could increase adoption of improved varieties since it may yield optimal combination of varietal attributes and thus scale up youth agripreneurship in potato farming.

## Objective

The main objective of this study was to determine the preferences and willingness to pay for climate resilient potato varieties by youth farmers in Nakuru County in order to increase their resilience to climate change and scale up youth engagement in potato agribusiness.

## Methodology

The study was carried out in Molo Sub-county, which is one of the six sub-counties in Nakuru County, Kenya. It is the second largest potato producer in Kenya, characterised by fertile soils and favourable climatic conditions. It hosts a potato seed multiplication project that produces certified potato seeds for farmers in different parts of the country. The data used for the study was obtained from a household survey at farm level conducted by well-trained enumerators and administered through structured questionnaires. The sample was drawn from smallholder youth potato farmers in Molo Sub-county using a multistage sampling technique. Nakuru County and Molo Sub-county were purposively selected in the first stage. The four administrative wards in Molo Sub-county (Mariashoni, Elburgon, Turi and Molo) were purposively selected in the second stage and finally a random sample of 119 youth farmers (aged 18-35 years) was select-



ed from the four wards using simple random sampling technique.

A Choice Experiment was conducted to determine the key attributes preferred by youth farmers for climate resilient potato varieties and willingness to pay for each attribute. Interactions between climate resilient potato attributes and socio-economic characteristics of farmers were analysed to account for differences in preferences. A focus group discussion comprising 20 experienced young potato farmers, decentralised seed multipliers, agricultural extension officers and researchers was conducted to validate the attributes and attribute levels proposed for the experiment. Mixed logit model was used for econometric analysis of farmers' preferences using STATA Version 15.

## Findings

This section presents findings for youth farmers' preferences and willingness to pay for various potential climate resilient potato attributes. The response rate was 100 percent, with 119 young farmers participating in the choice experiment.

### Youth Farmers' preferences for improved CRPVs

The findings of this study indicated that although farmers usually consider productivity of potato varieties when making decisions on whether to adopt or not, attention is slowly shifting to the adaptability of potato varieties to the

changing factors of climate that have adverse effects on potato crop. Youth farmers in this study mostly preferred climate resilient potato varieties that were resistant to pests and diseases. The estimated coefficient for resistance was positive and almost thrice (3.661) the magnitude of all other attributes. This can be explained by changes in climatic conditions; for instance, increased temperature and humidity, which increase the severity of pests and diseases such as late blight and bacterial wilt. Severity of pests and diseases calls for increased use of pesticides, which in most cases are expensive and unaffordable to young farmers who are usually financially constrained (Muiderman et al., 2016). Therefore, in attempts to adapt to climate change and increase resilience, youth farmers seek potato varieties that are highly resistant to pests and diseases. A young farmer from Molo Sub-county said, "I prefer potato varieties that are resistant to pests and diseases as they require less spraying of pesticides, hence reducing production cost and yield loss, which translates to higher profit margins from sale of ware potatoes."

The estimated coefficient for low water requirement was positive with a magnitude of 1.382, indicating that low water requirement was the second most preferred attribute after resistance to pests and diseases. Due to the negative effects of factors of climate change such as unseasonal rainfall and reduced precipitation, youth farmers preferred potato varieties that require less water to grow so as to ensure yield stability even in seasons of poor rainfall. More so, youth farmers are limited in terms

of resources and farm equipment such as the modern irrigation systems, hence varieties with low water requirements were more favourable. Farmers prefer varieties that are tolerant to environmental stress factors such as poor rainfall.

The coefficient of high yield (0.959) was positive, revealing that young potato farmers from Molo Sub-county preferred varieties that were high yielding (30T/Ha). This finding was as expected for a rational decision maker trying to maximise utility. High yielding varieties are preferred by farmers as they ensure food security and increased income from sales, hence reduced household poverty. Climate change leads to yield loss and reduced productivity. The attribute of short maturation period (<3 months) had a positive coefficient with a magnitude of 1.313. This indicates that youth potato farmers preferred varieties that matured faster. Varieties that mature fast are usually less affected by adverse effects of climate change such as poor rainfall, frost, potato blight and drought (Gamboa et al., 2018). It is important to note that high yield was the least preferred attribute as compared to other listed attributes in adapting to climate change by youth farmers from Molo Sub-county.

The input price attribute was negative, indicating that farmers preferred lower prices for CRPVs, holding all other factors constant. However, the absolute magnitude of the price coefficient was relatively small, revealing that young potato farmers from Molo Sub-county were low-price responsive. A small change in price did not affect their preferences for other CRPV attributes. This was contrary to Wanyama et al. (2019) who reported high-price responsiveness for low income consumers. The contrast shows that youth farmers from Molo Sub-county valued environmentally adaptable potato varieties despite the price mark up. Another young potato farmer pointed out that, "If I can manage to counter production constraints brought about by climate change such as severity of pests and diseases and lack of adequate rainfall from a 50kg bag of potato seeds that is high yielding and matures in less than three months, then a relatively high cost of that one bag would not stop me from purchasing it since I am certain the sales will cover the cost and the profits will be rewarding enough."

### Sources of Preference Heterogeneity

The interaction between gender and resistance to pests and diseases had a negative and significant coefficient.

This shows that being a young male potato farmer decreased the preference for potatoes that were resistant to pests and diseases by 20.63 percent. More young female farmers preferred potato varieties that were resistant to pests and diseases as a coping strategy against climate change than young male farmers. This can be explained by the fact that young female farmers are more financially constrained than their male counterparts and since resistant varieties would save them expenditure on pesticides, it was a more attractive attribute (Mudege et al., 2019, Muiderman et al., 2016).

The interaction between gender and high yield had a positive and significant coefficient. This shows that being male increased the preference for high yielding potato varieties by 18.17 percent. This can be explained by the fact that most young, male farmers are more business-oriented and practise agribusiness unlike young female farmers who in most cases farm potato for household food and nutrition security. Male farmers prefer potato varieties with higher yield so as to boost their income levels from increased sales. This was emphasised by a young female farmer from the study area who said, "I prefer potato varieties that are resistant to pests and diseases more than high yielding varieties because resistant varieties will ensure yield stability, which will help me secure food requirements for my family, despite the prevailing climatic conditions." She added that resistant varieties were low-cost maintenance in terms of spraying, which she could not afford every season or access the recommended pesticides in required amounts.

### Willingness to pay for CRPVs

This sub-section presents results for the estimation of Willing to Pay (WTP) for CRPVs. The price attribute represented the purchasing price for CRPV seeds and was captured as price per 50kg bag, which is the most popular recommended packaging method for potato seeds in Kenya. However, for purposes of favourable econometric modelling, the price variable entered the model as Kenya Shillings per kilogram, implying that the WTP values should be multiplied by 50 since the price variable was divided by 50 during estimation.

Positive values show the amount farmers would be willing to pay to acquire preferred attributes whereas negative values indicate the discount farmers would demand for accepting less preferred attributes for CRPVs. Table 3 shows the estimated WTP values for each of the CRPV attributes.



Table 1: WTP Values for CPRV Attributes

Variables	Marginal WTP	Lower CI	Upper CI
Resistant to pests and diseases	109.267	0.042	218.491
Low water requirements	41.258	-5.612	88.129
High Yield (30T/Ha)	28.625	-5.496	62.747
Short Maturation Period (<3 months)	39.188	-4.422	82.797

CI, Confidence Interval at 95% confidence level

The willingness to pay estimates highlight the extent to which young potato farmers value climate resilient potato attributes. The first observation is that the willingness to pay values for climate resilient potato attributes average around the same value except for the resistant to pests and diseases attribute, whose willingness to pay value was over three times more than all other attributes, while the high yield attribute had the least willingness to pay value. This means that on average, young potato farmers in Molo Sub-county were willing to pay more for the resistant to pests and diseases attribute than for any other attribute despite the price mark up. This is justified as pests and diseases comprise the most important challenge facing potato production in Kenya and has been worsened by the adverse effects of climate change.

Looking further into the details of Table 1, young potato farmers in Molo Sub-county would be willing to pay an average of USD 11 per kilo for varieties resistant to pests and diseases, USD 41 per kilo for varieties that have low

water requirements, USD 28 per kilo for high yielding varieties (30T/Ha) and above, and USD 39 per kilo for varieties with short maturation period (<3 months). However, it should be noted that this analysis was based on stated preference data, which is subject to hypothetical bias. Thus, willingness to pay values should be interpreted as high preferences rather than a strategy to develop feasible price mark-up for climate resilient potato attributes (Gamboa et al., 2018).

### Lessons Learnt

The lessons learnt from this research include:

- Environmentally adaptable potato varieties are highly preferred by young farmers in Molo Sub-county in an attempt to counter the adverse effects of climate change and variability.
- It is usually expected that most farmers only prefer high yielding crop varieties. However, from the research findings of this study, young potato farmers mostly prefer varieties that are resistant to pests and diseases.





- Other attributes preferred for climate resilient potato varieties include; low water requirements, short maturation period (less than three months) and high yielding (30T/Ha) for coping with the adverse effects of climate change and variability.
- Young female potato farmers mostly prefer resistant varieties unlike their male counterparts who mostly prefer high yielding varieties.
- Despite young farmers being categorised as low-income consumers, young potato farmers from Molo Sub-county are low price-responsive. A small change in price does not affect their preferences for other climate-resilient potato attributes.
- Uniqueness of young farmers' needs, considering their limitations in terms of resources and weak financial base, should be acknowledged across the potato value chain.
- to agripreneurship.
- There is a need for tailor-made exposure programmes for youth farmers in dissemination of climate resilient varieties. For instance, training sessions on improved varieties should be organised targeting mainly youth farmers. Some young potato farmers said they had not adopted the available climate resilient varieties because they were not aware that they actually existed. Exposing them to these varieties will eventually prompt adoption and thus increase their resilience to the adverse effects of climate change and variability, which will further scale up their engagement in potato agripreneurship.
- Young potato farmers who are mostly resource poor should be encouraged to form youth farming groups and be educated on the importance of collective action. This will help them create a pool of resources, access credit facilities and inputs such as quality seeds on time, hence enabling them to scale up potato agripreneurship.
- Gender differences in adoption of improved varieties among youth farmers should also be considered and programmes to empower young female farmers should be developed and implemented to enable them access necessary resources to increase their resilience to climate change and scale up their engagement in agribusiness projects. This includes encouraging them to engage in agriculture not only for subsistence but also as a business venture.

### Scaling up Youth Agripreneurship in Potato Farming

From the research findings, various ways of scaling up youth engagement in potato agripreneurship were recommended as outlined below;

- Research institutions and other stakeholders in the potato value chain should acknowledge the uniqueness of young farmers' needs, considering their limitations in terms of resources and weak financial base, and incorporate their preferences during breeding and dissemination programmes to scale up adoption of climate resilient varieties and boost pota-

## References

1. Asrat, S., Yesuf, M., Carlsson, F. & Wale, E. (2010). Farmers' preferences for crop variety traits: Lessons for on-farm conservation and technology adoption. *Ecological Economics*, 69(12), 2394-2401.
2. Atlin, G. N., Cairns, J. E. & Das, B. (2017). Rapid breeding and varietal replacement are critical to adaptation of cropping systems in the developing world to climate change. *Global Food Security*, 12, 31-37.
3. Gamboa, C., Van den Broeck, G. & Maertens, M. (2018). Smallholders' Preferences for Improved Quinoa Varieties in the Peruvian Andes. *Sustainability*, 10(10), 3735.
4. Hole, A. R., & Kolstad, J. R. (2012). Mixed logit estimation of willingness to pay distributions: a comparison of models in preference and WTP space using data from a health-related choice experiment. *Empirical Economics*, 42(2), 445-469.
- International Potato Center. (2017). Accelerated value chain development program. Root crops quarter 3 of year 2 report, International Potato Center, Lima, Peru.
5. Jaetzold, R., Schmidt, H., Hornet, Z.B., Shisanya, C.A. (2007). *Farm Management Handbook of Kenya. Natural Conditions and Farm Information*. vol. 11/C. Eastern Province, 2nd ed. Ministry of Agriculture/GTZ, Nairobi, Kenya.
6. Kassie, G. T., Abdulai, A., Greene, W. H., Shiferaw, B., Abate, T., Tarekegne, A., & Sutcliffe, C. (2017). Modeling Preference and Willingness to Pay for Drought Tolerance (DT) in Maize in Rural Zimbabwe. *World Development*. 94, 465-477.
7. Kivuva, B. M., Musembi, F. J., Githiri, S. M., Yencho, C. G., & Sibiya, J. (2014). Assessment of production constraints and farmers' preferences for sweet potato genotypes. *Journal of Plant Breeding and Genetics*, 2(1), 15-29.
8. Kjær, T. (2005). A review of the discrete choice experiment-with emphasis on its application in health care.
9. Kyamanywa, S., Kashaia, I. N., Getu, E., Amata, R., Senkesha, N. & Kullaya, A. (2011). Enhancing food security through improved seed systems of appropriate varieties of cassava, potato and sweet potato resilient to climate change in Eastern Africa. Kenya Agricultural and Livestock Research Organisation. (2017). *Food Security Report: Policy responses to food crisis in Kenya*.
9. Lecocq, S. (2008). Variations in choice sets and identification of Mixed Logit models: Monte Carlo evidence. *Variations in choice sets and identification of mixed logit models: Monte Carlo evidence* (2008). Louviere, J.J., Flynn, T.N., Carson, R.T. (2010). Discrete Choice Experiments Are Not Conjoint Analysis. *Journal of Choice Modelling*, 3(3), 57-72.
10. Maligalig, R., Umbeger, W., Demont, M., & Peralta, A. (2018). Farmer preferences for rice varietal trait improvements in Nueva Ecija, Philippines: A latent class cluster approach.
11. Mudege, N. N., Mbiri, D., & Mdege, N. (2019). Making the agriculture sector work for youth: A tool to promote young men and women's engagement in growing root, tuber and banana crops.
12. Muiderman, K., Goris, Y., & Ates, B. (2016). Youth inclusiveness in agricultural transformation. Republic of Kenya. 2017. Ministry of Agriculture Livestock and Fisheries. Kenya Youth in Agribusiness Strategy 2017-2021. Positioning the youth at the forefront of Agricultural Growth and Transformation.
13. Otieno, D. J., & Oluoch-Kosura, W. (2019). Assessment of local stakeholders' preferences for foreign land lease design attributes in Kenya: A participatory choice-based survey approach. *Heliyon*, 5(10), e02730.
14. Oyinbo, O., Chamberlin, J., Vanlauwe, B., Vranken, L., Kamara, Y. A., Craufurd, P., & Maertens, M. (2019). Farmers' preferences for high-input agriculture supported by site-specific extension services: Evidence from a choice experiment in Nigeria. *Agricultural systems*, 173, 12-26.
15. Pambo, K. O., Otieno, D. J., & Okello, J. J. (2014). Consumer awareness of food fortification in Kenya: The case of vitamin-A-fortified sugar (No. 138-2016-2041).
16. Patel-Campillo, A., & García, V. B. S. (2018). Un/associated: Accounting for gender difference and farmer heterogeneity among Peruvian Sierra potato small farmers. *Journal of rural studies*, 64, 91-102.
17. Sánchez, B. I., Kallas, Z., & Gil Roig, J. M. (2017). Farmer preference for improved corn seeds in Chiapas, Mexico: A choice experiment approach. *Spanish Journal of Agricultural Research*, 15(3).
18. Sibiya, J., Tongoona, P., Derera, J., & Makanda, I. (2013). Farmers' desired traits and selection criteria for maize varieties and their implications for maize breeding: A case study from KwaZulu-Natal Province, South Africa. *Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS)*, 114(1), 39-49.
19. Van den Broeck, G., Vlaeminck, P., Raymaekers, K., Velde, K. V., Vranken, L. & Maertens, M. (2017). Rice farmers' preferences for fairtrade contracting in Benin: Evidence from a discrete choice experiment. *Journal of cleaner production*, 165, 846-854.
20. Wanyama, R., Gödecke, T., Jager, M., & Qaim, M. (2019). Poor consumers' preferences for nutritionally enhanced foods. *British Food Journal*. 121(3), 755-770.

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# 8

## CHAPTER EIGHT

Impact of Information and Communications Technology (ICT) Usage on Income of Youth Agripreneurs in Kenya

 By VICTOR KILUI

## CHAPTER EIGHT

# Impact of Information and Communications Technology (ICT) Usage on Income of Youth Agripreneurs in Kenya

BY VICTOR KILUI

### Introduction

Information and Communications Technology (ICT) has considerable potential in enhancing youth engagement in agribusiness. This is considering the fact that in today's agricultural sector, information access is critical for the efficient functioning of markets and in improving the management of agrienterprises. Youth agripreneurs need sufficient information and exposure to the latest technologies, which may influence their participation in agribusiness.

Recent developments in ICT in sub-Saharan Africa are viewed as one of the strategies to minimise information asymmetry among youth agripreneurs. In addition, utilisation of ICT in agrienterprises facilitates access to technical and market information among rural youth agripreneurs. However, for these youth to benefit from such technologies they must first have access to them and learn how to utilise them in their agrienterprises. This has necessitated many public, private and developmental partners to invest in pro-





grammes and projects geared towards improving ICT adoption, especially in sub-Saharan African countries. These projects include; iCow, Kenya Agricultural Commodity Exchange (KACE), National Livestock Market Information System (NLMIS), Regional Agricultural Trade Intelligence Network (RATIN), National Farmers Information Service (NAFIS) and M-farm, among others.

In the last decade, usage of ICT tools such as mobile phones, television and radio in accessing agricultural information and undertaking transactions has become a great phenomenon in the development of youth-based agribusinesses. For example, use of mobile phones may assist youth agribusinesses to access market information so as to obtain better prices for produce. This saves them from exploitation by middlemen who take advantage of prevailing information gap. These tools also serve as a means for effective transfer of knowledge and information about agricultural production and new technologies. Hence, youth agribusinesses can make timely, reliable, realistic and economically viable decisions concerning what crops to grow, when to grow them, what products are for sale, when and where, what inputs to use and how to use them. Financial inclusion of smallholder youth agribusinesses has also been increased through the use of mobile money services and mobile banking.

Despite a growing portfolio of innovative and educative agro-based information on ICT tools and an increased availability and affordability of such tools, sub-Saharan Africa is yet to fully realise its potential in ICT adoption in agriculture. This can be attributed to limited empirical evidence on the effect of ICT tools on performance of youth-based agribusinesses, since such information might identify the constraints impeding adoption of ICT. Given this backdrop, this study attempts to address this gap in the existing knowledge by providing a micro perspective on the effect of ICT use on youth agribusinesses' in Kenya.

## Methodology

This study mainly used structured questionnaires to collect data from a total of 183 pineapple youth agribusinesses from four wards (Gakoe, Kanyoni, Kamwangi and Mangu) of Gatundu North Sub-county, Kiambu County. Multi-stage sampling procedure was used to select the youth agribusinesses. The data was analysed using descriptive statistics and regression analysis.

## Findings

### Factors influencing use of ICT among youth agribusinesses

The survey revealed that the most commonly used ICT tools in accessing technical, market and financial information among youth agribusinesses were mobile phones





(86 percent), radio (79 percent) and then television (59 percent). Among the 183 youth agripreneurs sampled, 93 were using ICT in their farm business while 90 were not using the tools. This indicates that many of youth agripreneurs still do not capitalise on the merits of using ICT in their agribusinesses.

The researcher interrogated the factors that may influence the youth's decision to use ICT tools in their agrienterprises. The results revealed that younger farmers are more likely to use ICT tools, which is probably related to them being highly innovative and more enterprising. Better educated youth agripreneurs are also more likely to use ICT tools in their agrienterprises. This is plausible because education helps them to be more knowledgeable and equips them with the ability to use modern agricultural technologies. In general, the study found that better educated youth agripreneurs tend to be more innovative and therefore more likely to use ICT tools to access agricultural information.

The study found that youth agripreneurs who are engaged in off-farm employment have significantly higher probability to use ICT tools in their agrienterprises. This could be due to certain capital investments necessary for purchasing the ICT tools, which are facilitated through off-farm earnings, especially when there are credit con-

straints. Furthermore, availability of off-farm income may aid youth agripreneurs to have short-term liquidity against the background of lagged payment schedules. It was also found that youth agripreneurs with bigger land size are more likely to use ICT in their farm business. Large farm size may lead to high production, which may trigger the youth to adopt and use ICT tools to search for markets for their produce.

In a similar fashion, youth agripreneurs who had access to electricity in their farms were more likely to use ICT. This is plausible because unless there is electricity to power ICT tools, youths are not able to use these tools in their agrienterprises. Access to ICT extension services promotes use of ICT among youthful agripreneurs. Extension agents promote dissemination of agricultural information, technologies and facilitate exchange of ideas in cheaper and affordable ways. Thus, the more enhanced access to extension services, the higher the likelihood of using ICT tools in youth-based agrienterprises.

Participation in group activities promotes use of ICT among youth agripreneurs. Group membership enables youths to share information and they could prefer usage of ICT tools to communicate. For example, youthful farmers could find it convenient to use mobile phones to share information, particularly if they are far apart. Furthermore, this could be



due to the relatively cheaper cost of calling and using the short message service (SMS) rather than physically meeting. Finally, ICT training, agricultural training and ICT affordability further promote ICT use in youth-based agribusinesses.

### Structure of ICT usage among youth agripreneurs

This study examined the structure of ICT usage among the sampled youth agripreneurs with regards to the utilisation of television, radio and mobile phones. In relation to use of television, the most viewed television programmes were NTV – Seeds of Gold (17%), Utugi TV – Kilimo na Faida (10%), Inooro TV – Mugambo wa Murimi (9%), QTV – Mkulima ni Ujuzi (8.7%) and Citizen TV – Shamba Shape Up (8.2%). Moreover, the findings show emergence of several new TV stations, which were also disseminating agricultural information to youthful agripreneurs. These included Utugi TV – Kilimo na Faida, QTV – Mkulima ni Ujuzi, Signet Farmer and Njata TV – Urimi. High usage of television to access agricultural information is due to a good number of vernacular stations and appropriate airing time. Further, the youthful agripreneurs were using radio to access agricultural information. Majority of the youths (68%) were listening Inooro FM, 30% Kameme FM, 11% Milele FM while 4.9% were listening to Utugi FM and Radio Citizen, respectively. The dependence on radio by rural youth agripreneurs is mostly due to the wide coverage of radio frequencies and availability of many radio stations.

With regards to the usage of mobile phones, Table 1 shows the main type of information disseminated from mobile phones was market information (67%) and input

information (49%). The youth agripreneurs consider market and input information as very important agricultural information that can help them secure a reliable market to sell their produce and gain more income that will help them to improve farming activities and their living standards. This information was disseminated through phone calls and SMS. The SMS was a low-cost mechanism for disseminating price information that may reach a significant portion of youth agripreneurs.

The youths were asked other uses of mobile phones apart from accessing agricultural information. A majority of them (47%) used mobile phones to communicate with input suppliers, while 36% used them for mobile banking and money transfer. Conversely, 15% and 6% of the youth agripreneurs used mobile phones for communication with customers and marketing of products, respectively. The use of mobile phones enables youth farmers to market their produce directly to their trusted buyers, thus maximising their profits.

Through direct marketing, remote youth-based agribusinesses are able to lower transaction costs and enhance profits by eliminating the middlemen. Also, online platforms such as M-Farm, M-Shamba provide information at a fee to youth agripreneurs who obtain market, price, crop and weather information via their mobile phones. In addition, these firms offer youth agripreneurs the chance to sell their crops collectively and to buy their seeds, fertilisers and other inputs by simply using their mobile phones. This business model reduces the burden of depending on middlemen for market access while increasing the abilities of youthful agripreneurs to profit from information sharing through ICT.

Table 1. Type of information accessed from ICT tools

Type of information	Mobile phone (%)	Television (%)	Radio (%)
Market	67.2	11.5	21.3
Input	49.2	9.8	18.6
Weather forecast	15.3	5.5	13.1
Diseases	19.1	8.2	14.8
Good agricultural practice	14.2	33.9	38.8
Value addition	5.5	9.3	5.5

Using television, a majority of the youth received information on good agricultural practices (33%) and input information (12%). The good agricultural practices disseminated by television included sustainable agriculture techniques to achieve key goals of weed, pest, disease and erosion control, and high soil quality to improve productivity of their agrienterprises. Good agricultural practices (39%) and input information (21%) were also the main information accessed from radio. Dissemination of input information over the radio meets the requirements for being a medium for mass dissemination, with a broad coverage of the entire country at a low cost. However, an evaluation of the way the information is received shows that its efficiency depends on whether the person receiving it is present during the broadcast; otherwise, the message is lost.

### Patterns of mobile money usage

Table 2 presents how mobile phone and mobile money were used by the youth agripreneurs. Among the ICT users, 97% were using mobile money services in their agrienterprises. The two main mobile money transfer accounts owned by the youth agripreneurs were M-pesa (94%) and Airtel money (6%). The results show Safaricom's M-pesa is the most preferred by the youth and it has been at the forefront of Kenya's agri-technological innovations. The study further revealed that 67 percent of youth agripreneurs had borrowed money from mobile bank accounts, while 33% had not. A majority of the youth (59%) had borrowed from M-Shwari, 37% from Equitel (Equity Bank mobile application), 16% from KCB Bank mobile account and 13% from Co-operative Bank mobile account. Despite the important role of mobile phones in linking youth agripreneurs with the formal banking system, the cost of these services was found to

be too high for most youthful farmers. For example, one respondent said, "The interest rates are too high and this hinders me from taking more loans."

Table 2. Usage of mobile money and mobile banking

Usage of mobile money services	Percentage (%)
Yes	96.7
No	3.3
Mobile money account owned	
M-pesa	94.3
Airtel money	5.7
Mobile bank account	
M-Shwari	58.5
Equitel	37.2
KCB Bank mobile account	16.4
Co-operative Bank mobile account	12.6

### Impact of ICT usage on income of youthful agripreneurs

Th results revealed that ICT users had higher gross margins (KSh128,389/acre) from the sale of pineapples in relative to ICT non-users (KSh92,455/acre). This means the use of ICT tools helps youth agripreneurs to increase their business income.

One youth respondent said, "I really depend on mobile phones, radio and television as sources of information, for market access and running day-to-day activities, which positively influences performance of my business." Another respondent said, "ICT tools enable us to engage



in digital marketing and access financial services, which were not accessible in formal marketing and financial institutions.”

Therefore, usage of ICT tools increases market access for youth farmers, which leads to increase in returns from agricultural production.

## Lessons learned

The following lessons were learned from implementing the cross-sectional survey.

1. Socio-economic and institutional factors such as age, education, farm size, occupation, access to electricity, extension contacts and group membership significantly influenced youth decision to use ICT in their agribusiness.
2. Electricity for powering ICT tools is the primary constraint to using ICT in youth agrienterprises.
3. Extension services and group membership can be powerful tools used to transfer new technologies to youthful farmers and means of fixing challenges in the agrienterprises through information sharing. Group membership is also an important factor influencing use of ICT tools. It is therefore important to introduce youth agripreneurs to new technologies, and the promotion needs to be done in youth groups.
4. Training empowers youth agripreneurs by giving them skills and knowledge that facilitate them to access better technologies and acquisition of farm inputs. Through trainings and affordability of ICT tools, youth agripreneurs are able to purchase and use ICT tools in their agrienterprises.
5. Utilisation of ICT positively influences household income of youth agripreneurs. For example, youth agripreneurs who were using ICT realised more crop income per acre than non-users. Hence, it can be concluded that use of ICT leads to increase in income of smallholder youthful farmers' agrienterprises. This finding underscores the need to integrate ICT in youth-based agribusinesses.
6. Digital marketing has increased market access and visibility of youth-run agribusinesses, which has positively influenced their incomes.
7. Use of ICT tools such as mobile phones has increased financial inclusion of youth agripreneurs, and digital borrowing remains a key source of finance for majority of youth agripreneurs.

Scaling up youth agripreneurship using ICT

1. There is a need for professional development and

capacity building of youth lacking formal education through access to trainings on utilisation of ICT in their farm businesses.

2. Increased access to extension services from both private and public agencies is imperative to increase uptake of ICT among youthful farmers. Government role should include raising ICT capacity levels of extension staff and ensuring that they are conversant with ICT enabled extension.
3. The government and developmental partners should also invest in infrastructural development projects, especially access to electricity and good communication network coverage, which is key for uptake of ICT in rural youth-based agrienterprises.
4. To increase uptake of mobile loans, there is a need for regulation on the high interest rates imposed on digital lending to smallholder youth agripreneurs.
5. Youth agripreneurs need to be empowered on proper accounting and personal financial management, especially in relation to digital lending. Youth agripreneurs should be cautioned on debt financing. They should borrow money when they need it, and use it specifically for business purposes.

## References

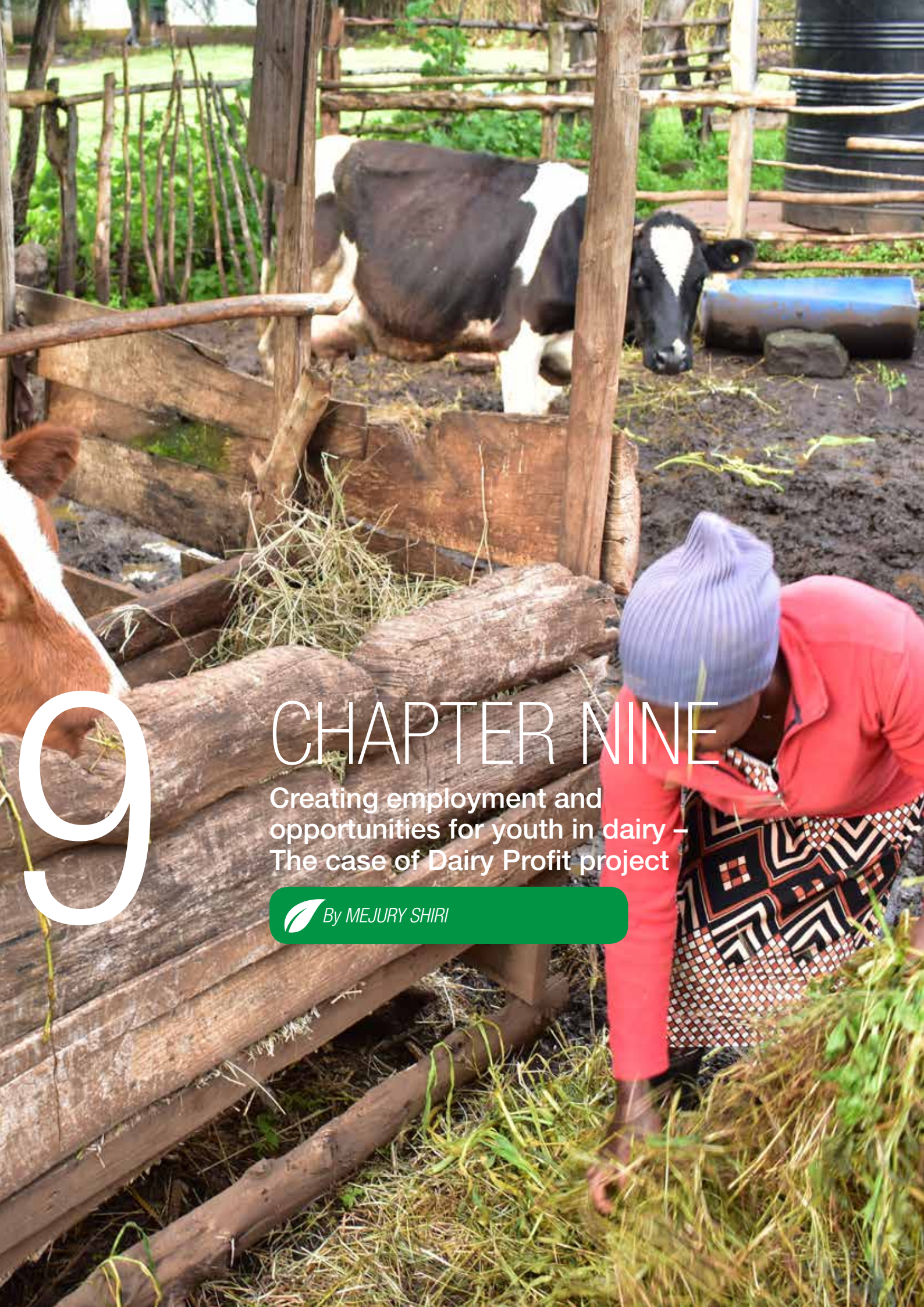
- Alderete, M. V. (2017). Mobile broadband: A key enabling technology for entrepreneurship? *Journal of Small Business Management*, 55(2), 254–269.
- Alene, A. and Manyong, V.M. (2007). The effect of education on agricultural productivity under traditional and improved technology in northern Nigeria: an endogenous switching regression analysis. *Empirical Economics*, 32 (1), 141-159.
- Barrett, C.B. (2008). On the Relevance of Identities, Communities, Groups and Networks to the Economics of Poverty Alleviation. In: *The Social Economics of Poverty: On Identities, Communities, Groups and Networks*. Edited by Barrett C.B. London: Routledge.
- Birke, F. M., Lemma, M., & Knierim, A. (2019). Perceptions towards information communication technologies and their use in agricultural extension: Case study from South Wollo, Ethiopia. *The Journal of Agricultural Education and Extension*, 25(1), 47–62.
- Bothhoko G.J & Oladele O.I (2013). Factors affecting farmers' participation in agricultural projects in Ngaka Modiri Molema district North West province, South Africa. *Journal Human Ecology*, 41(3), 201-206.

- Carter, D.W. & Milon, J.W. (2005). Price knowledge in household demand for utility services. *Land Economics* 81(2), 265-283
- Chatterjee, A. (2020). Financial inclusion, information and communication technology diffusion, and economic growth: a panel data analysis, *Information Technology for Development*, 26(3), 607-635
- Di Falco, S. & Veronesi, M. (2013). How African agriculture can adapt to climate change? A counterfactual analysis from Ethiopia. *Land Economics*, 89(4), 743 –766.
- Duncombe, R. (2016). Mobile phones for agricultural and rural development: A literature review and suggestions for future research. *The European Journal of Development Research*, 28(2), 213–235.
- Heeks, R. (2018). *Information and communication technology for development (ICT4D)*. Abingdon, Oxfordshire: Routledge.
- Heeks, R., & Stanforth, C. (2015). Technological change in developing countries: Opening the black box of process using actor–network theory. *Development Studies Research*, 2(1), 33–50.
- Ilavarasan, P. V., & Otieno, A. (2018). Tiny impact of ICTs and paucity of rigorous casual studies: A systematic review of urban MSMEs in the developing world. *Technologies & Information Development*, 14, 134–150.
- Lee, G., Shao, B., & Vinze, A. (2018). The role of ICT as a double-edged sword in fostering societal transformations. *Journal of the Association for Information Systems*, 19(3), 1.
- Lokshin, M., & Sajaia, Z. (2004). Maximum likelihood estimation of endogenous switching regression models. *Stata Journal*, 4(3), 282-289.
- Mwaura, S. N., Muluvi A. S. & Mathenge, M. K. (2014). African Leafy Vegetables and Household Wellbeing in Kenya: A Disaggregation by Gender. *Current Research Journal of Social Science*, 6 (4), 82-94.
- Mwombe, S.O.L., Mugivane, F.I., Adolwa, I.S. & Nderitu, J.H. (2014). Evaluation of Information and Communication Technology Utilization by Small Holder Banana Farmers in Gatanga District, Kenya. *Journal of Agricultural Education and Extension*, 20, 247–261.
- Negash, M., & Swinnen, J. (2013). Biofuels and food security: Micro-evidence from Ethiopia. *Energy Policy*, 61(2), 963-976.
- Ntwoku, H., Negash, S., & Meso, P. (2017). ICT adoption in Cameroon SME: Application of bass diffusion model. *Information Technology for Development*, 23(2), 296–317.
- Okello, D.O., Feleke, S., Gathungu, E., Owuor, G., & Ingasia, A.O. (2020). Effect of ICT tools attributes in accessing technical, market and financial information among youth dairy agripreneurs in Tanzania, *Cogent Food & Agriculture*, 6:1, 1817287.
- Okello, J.J. Ofwona, E. Mbatia, O.L.E and Okello, R.M. (2011). Using ICT to integrate smallholder farmers into agricultural value chain; The case of DrumNet project in Kenya. *International Journal of ICT and Research Development*, 1(2), 23-37
- Olaleye, R.S., Gana, F.S., Umar, I.S., Ndanisa, M.A. & Peter, E.W. (2009) Effectiveness of Radio in the Dissemination of Agricultural Information among Farmers in Edu Local Government Area of Kwara State, Nigeria. *Continental Journal of Agricultural Science*, 3(1):1–6.
- Sigei, K. G., Bett, K. H., Kibet, K. L. and Mutai, C. M. (2013). Determinants of Market Participation among Small-Scale Pineapple Farmers in Kericho County, Kenya. *Journal of Economics and Sustainable Development*, 4 (19): 59-66.
- Sekabira, J. Bonabana, W, Narathius, A. & Haruna, A. (2012). Determinants for Adoption of ICT-Based Market Information Services by Smallholder Farmers and Traders in Mayuge District, Uganda. *Journal of Agricultural Economics*. 2(1):13-16.
- Walsham, G. (2017). ICT4D research: Reflections on history and future agenda. *Information Technology for Development*, 23(1), 18–41.
- Zaremohzzabieh, Z., Abu Samah, B., Muhammad, M., Zobidah, O., Bolong, J., Bin Hi Hassan, S., Shaffril, H. A. M., et al. (2016). Information and communications technology acceptance by youth entrepreneurs in rural Malaysian communities: The mediating effects of attitude and entrepreneurial intention. *Information Technology for Development*, 22(4), 606–629.

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# 9

## CHAPTER NINE

Creating employment and opportunities for youth in dairy – The case of Dairy Profit project



By MEJURY SHIRI



## CHAPTER NINE

# Creating employment and opportunities for youth in dairy – The case of Dairy Profit project

BY MEJURY SHIRI

### Introduction

Despite becoming a low middle-income country in 2014, Kenya has the highest number of unemployed youth in East Africa. Annually, nearly one million young people enter the job market, adding to the existing pool of job seekers. Addressing youth employment is an urgent need, as approximately 70 percent of the country's population is aged below 30 years (FAO, 2019). Like in any other African country, agriculture plays a key role in Kenya's economy, contributing about 25 percent of the Gross Domestic Product (GDP). The agriculture sector employs around 60 percent of the population in most counties, except Nairobi and Mombasa, and agriculture is the major economic activity among the rural population. Dairy is the largest agriculture subsector in Kenya, contributing 14 percent of agricultural DGP with an annual growth rate of 4.1 percent (Feed the Future, 2018). The dairy subsector is estimated to provide employment to over two million people either directly or indirectly along the value chain. Kenyan dairy is transitioning from subsistence to commercialisation, and this is attracting huge investments. The sheer size of the sector gives lucrative business and employment opportunities. However, the potential of the sector to create decent jobs for youth is far from being realised.



Kenya has a youthful population, and considering that agriculture is the major economic activity in the country, youth engagement is still limited. Agriculture is common among the elderly population, as the youth perceive it as a low ranked occupation mainly for the uneducated. In general, agricultural activities/employment has the connotation of not commanding respect and good earnings. Specifically, dairy farming is seen as hard and dirty work with low rewards (Anderweg et al., 2020; Sitawa et al., 2016).

Much like the agriculture sector in general, the dairy sector is dominated by the older generation of farmers who lack the commercial orientation. Although rural youth are ambivalent towards agriculture, they mostly also lack the commercial orientation. Specifically, adoption of dairy by the youth is still limited mainly because of the general perception of agriculture as a low ranking business or job; limited access to land, finance and inputs; and lack of education and practical experience.

According to Sitawa et al. (2016), the Kenyan education system does not adequately prepare the youth for careers in agriculture, and the programmes are often criticised for not providing graduates with the necessary practical and management skills. According to Anderweg (2020), only 10 percent of dairy farmers have tertiary or higher education. Young people often prefer migrating to cities instead of seeking alternative employment in agriculture value chains.

Most young people lack the finance to acquire their own land to start farming activities. The most common way of acquiring land and livestock is through inheritance when the parents die. However, Kenya has reported an increase in life expectancy over the past years, increasing the time it will take before youths can access the land (Sitawa, et al., 2016). Young people rarely access commercial capital as they lack asset ownership to pledge as collateral, as this is a major requirement by financial institutions. Many of the assets the youth use for agricultural activities belong to parents or elderly family members. On the other hand, due to the risky nature of agriculture, financial institutions are not keen on investing in it.

Other than the challenges mentioned above, the dairy subsector presents its array of challenges, making it less profitable mainly due to poor breed and breeding practices, poor husbandry practices and limited knowledge on milk quality and safety standards.

### Project Activities

To address some of the challenges and promote inclusive dairy development for over two years, CTA and its East African partners worked on the DairyProfit project to increase dairy productivity and incomes for smallholder farmers and youth enterprise in Kenya, Tanzania and Ethiopia. In Kenya, the project was implemented by Performer Agribusiness, a knowledge, advisory and consulting firm. The project mainly focused on youth enterprise development and employment creation for youth in dairy.



Despite the current challenges, the youth are considered an exceptional asset necessary for dairy transformation through innovative practices. Youth's openness towards new practices is key in development of, for example, new and environmentally friendly dairy practices, and to fully utilise the potential of new technologies such as ICT for the dairy sector (Anderweg, et al., 2020).

### Youth as dairy advisors and managers

The project trained a group of 25 youth through the on-farm coaching programme. The group comprised youth already working in dairy with formal education but lacking practical experience, and unemployed youth who have been less exposed to formal education and are potentially employable as dairy advisors. The youth groups that were already working in dairy were supported to develop short-term business graduation plans for their farms. These measures included investments in feeds and fodder, cow health and other dairy herd management practices that have the highest potential to improve the quantity and quality of milk. The unemployed youth who received on-farm coaching were supported to provide advisory services through the the E-dairy Academy, making it possible for internet users interested in dairy knowledge to pay for sessions online. With over 50,000 views on social media, the prospects for the demand of video lessons remain high. In addition to the ICT support, these youth were trained exclusively on extension services at Dairy and Fodder Academy. The pilot group was already linked to 11 smallholder dairy cooperatives to

provide cooperative-based extension services, making it also affordable and efficient for the smallholder farmers.

### John transforms the dairy farm he manages

John Njonjo, a 28-year-old recent graduate in Animal Health, was identified as an enthusiastic and potential candidate for the on-farm coaching programme in support of youth who were already involved in dairy. John was working as a newly recruited farm manager at the Aberdare Range.

At the time of his recruitment, the farm was not into silage making, and the owner was not seeing the results of having recruited a new manager. The idea of training youth farm employees was to support them to bring results to the farms where they were employed. John was allowed a week of on-farm coaching, where he attended the training of dairy managers (youth) in Kajiado. Two weeks after the training, the on-farm support team followed to support him at the dairy farm where a benchmark was conducted and the gaps identified. A set of targets was made, top among them being to introduce silage in the farm where he worked. The farm's production of milk per day was 400 litres and he was given a target of 1,000 litres.

John began the farm's first silage project where he oversaw the planting of 40 acres of maize silage,



which secured the farm fodder for one year. As of end of May 2020, the farm where John works was producing 700 litres of milk per day. The farm owner talks very highly of John, he has more confidence in his abilities and takes his suggestions. John now supervises seven other workers.

John attributed his progress to the on-farm coaching programme he attended in Kajiado and the farm assessment that was done in his farm as part of the on-farm support programme targeted at the youth in dairy.

### Profiling youth enterprises

Inclusive business relationships were facilitated by linking/matching youth enterprises in fodder supply services to dairy cooperatives and processors. A survey was conducted on 100 cooperatives and 267 commercial farms. The most significant service for the majority of the cooperatives was the supply of fodder. A fodder processing equipment survey was done, and a mini-silage baler was identified in parts of India. The equipment was found suitable for the Kenyan context, and was brought into the country as the first mini-baler from India, making silage bales weighing between 50 and 60 kilos. The equipment is used to bale fodder materials owned by youth fodder entrepreneurs to make it possible to sell (silage needs to be baled for portability). The revenue models baling and selling the silage, as well as baling silage for a fee using the equipment. The youth accessed the equipment through a competitive grant for which 19 youth enterprises were selected, and are now producing on average 499,913 kilos (over 10,000 bales) of silage in months. The sector has balers that were making bales weighing between 300 and 400 kilos. These huge bales cannot be easily transported, especially by small-scale youth fodder entrepreneurs. Additionally, the project contributed to the development of the E-commerce trading platform to facilitate ordering of youth baled fodder ([www.dairyworld.co.ke](http://www.dairyworld.co.ke)). The project also facilitated formation of regular silage buying clusters of farms. The first 20 commercial farms have been formed, where the youth entrepreneurs can supply fodder regularly. Another innovation of the project is the agency method of fodder entrepreneurs where each entrepreneur is allocated a supplying zone of their choice.

### Zachary expands his business three-fold

Zachary has been making silage for the last six years. Before the start of the DairyProfit project, he had about 15 regular customers whom he was supporting with silage making at their farms. For the bulk of his customers, he would go out and look for standing maize, which he would buy, chop and carry long distances in trucks. The wet material would then be ensiled at a client's farm and Zachary would get his pay.

Due to the high cost of transport and ensiling, and the days spent doing manual work at the silo, Zachary could only support 15 farms. But now after accessing the mini-baler that makes 50-60kg bales, he was able to change his model. He secured 15 acres of maize in one place, and now hires a baler and delivers the silage to his clients, ready for feeding or further storage. Due to the efficient baling standards, the transport cost has reduced. Most importantly, the silage is no longer exposed to spoilage that comes with the long periods of silage making. The silage is safely packed in the bale and can be stored for months.

Zachary now has a catchment of over 45 farms, which he aims to continue supporting, and this has been made possible by the baling equipment. The farmers will save KSh8 (USD 0.08) per kilo from a high of KSh 20.50 (USD 0.2) to a low of KSh12.50 (USD 0.12). For an average farmer with five milking cows and feeding 150kg of silage in a day, the monthly saving is KSh36,000 (USD 360). And for him, he makes the same profit margin and has more time to be at his own small dairy farm and to look after his fodder farms.

### Capacity Building for Youth

The project offered learning and knowledge sharing opportunities through ESADA programmes. Transformative dairy practices were identified in Southern Africa, and two exchange visits took place between Kenya and Zimbabwe. Fifty-nine youth benefited from the experiential learning exchange visits, which showcased outstanding animal nutrition, feed and fodder management practices



that saw most youth enterprises changing their entire management practices. The Kenyan youths were also exposed to cattle banking models in Zimbabwe. The youth entrepreneurs proved to be more open to adopting new practices. In addition to the exchange visits, Performer developed two major modules for use by youth dairy entrepreneurs; one covered standard operating procedure for dairy and the other covered fodder establishment, management and preservation. The second module was specifically developed for fodder entrepreneurs that were supported through the mini balers. The two modules were combined in one handbook, which is ready for publishing. A total of 84 youth were trained at dairy and fodder academy. Of these 19 were supported as fodder entrepreneurs, the rest were a combination of farm managers, out-of-school youth, and youth working with cooperatives and youth who owned dairy farms.

### Simon Transforms his own Dairy Farm

Simon is an out-of-school youth who started his farm in Thika three years ago. Simon got an opportunity to sell his milk to a thriving restaurant within the town. He has four milking cows and was selling an average of 43 liters of milk a day at KSh60 per litre (USD 0.6). He was one of the youth who was supported on the category of youth owners of dairy farms. He attended the DairyProfit-supported dairy acad-

emy for a week. During the training he was most focused on feeding, which he believed is what he needed to improve at his farm. Simon attended the training in June 2019, after which he went and introduced silage on his farm. Simon made arrangements with two of the fodder entrepreneurs he was trained with to supply 6,000kg of maize silage every month to his farm. This was one of the start-up orders for the baled silage that the youth were selling.

At the point of introducing silage on his farm, Simon received on-farm support, where his farm was provided with rations and a fodder plan. The rations focused on the milking herd. Three months after the training and ration formulation, Simon's farm became a market for the fodder entrepreneurs, and also increased production to 73 litres of milk a day, a total increase of KSh54,000 (USD 540) a month from the additional 30 litres per day. With a plan to grow to 50 cows in the next five years, Simon will have a thriving commercial farm, providing a market for fodder and employment to many others.

### Opportunities for scaling up youth enterprises

Demand for milk and milk products in Kenya is growing at a rate of seven percent (Kenyan Dairy Board, 2019), the annual per capita consumption is growing at 110 litres

of liquid milk equivalence and is expected to double by 2030. The increasing demand for quality and safe milk and milk products by consumers, regional integration and cross-border trade, rising incomes and growth of the middle class and increasing diversification of consumption (for example, there is increasing demand for yoghurt and more cheese by hotels and fast food industry), offer an opportunity to transform milk value chains to economies of scale, creating new opportunities and decent jobs for youths not only as producers but as market actors along the supply chain. The DairyProfit project laid the foundation in training youth dairy enterprises on milk quality and safety standards to reduce losses along the supply chain as around 80 percent of the milk is marketed raw.

The project findings indicate that designing interventions centred on ICT solutions is a strategic approach, especially where the focus is to bring more youth on board. The steady rise in digital literacy among Africa's youth, coupled with the dairy sector's appetite for innovations, contributed immensely to the success of the DairyProfit project. Youth-led enterprises have the understanding and capacity to adopt digital services for their businesses, they are a good group to begin with, to provide the impetus needed for digitisation of the dairy sub-sector.

One of the main reasons dairy is not so common among young people is its extensive labour requirement and the harsh conditions throughout the supply chain from production to processing. The introduction of affordable machinery during the project indicated that the youth are more open to mechanised dairy activities. For instance, the mini-balers come at a time when there is a steady rise in demand and use of maize silage. This innovation has been appreciated by the youth enterprises, who are happy serving as fodder suppliers to commercial farmers. One of the key technologies that has been introduced in the developed dairy economies is that of vacuum baling and wrapping of maize silage. The DairyProfit programme developed this innovation further by supporting the introduction of smaller sized maize silage bales, which are efficiently compacted and easy to carry. All this mechanisation is expected to reduce the total labour requirement at the same time increasing productivity and profitability, making dairy more lucrative to the younger generation. These developments have increased farmers' access to maize silage and shown early signs of higher productivity and profitability. For the youth who were already running fodder businesses in the rural areas supporting entrepreneurial smallholder as well and medium level commercial

farmers the technology has made it easier for them to up-scale their business reach and volumes.

Kenya is predominantly a smallholder system on dairy and other commodities. But commercial dairy farming in Kenya is rising in two ways; the rise of commercial farms and the increase in the number of entrepreneurial smallholders. With this trend, the demand for skills is growing. The skill demand is at two levels; the supervisory skill and the dairy workers who carry out the farm operations. The farm owners are more and more willing to present their workers for training and the out-of-school youth are embracing training because of the prospects of getting a job in the farms. This, coupled with the desire for youth to run their own farms, was a key factor that led to receptiveness of youth towards the dairy management training and on-farm coaching programmes. In general, the rise in commercial dairy enterprises offers employment opportunities for youth in dairy advisory services or as skilled employees along the dairy value chain. Hence, the openness for youth to training in dairy programmes.

### Challenges encountered

Gender imbalance – Agriculture is generally a male dominated field, hence it is not surprising that over 85 percent of all participants trained as dairy managers, fodder entrepreneurs and out-of-school youth were men. Despite Performer's attempt to be gender inclusive, women's enrolment in project activities was low. Future interventions should combine women-led interventions with other activities that involve all. Gender friendly technologies (balers and dairy equipment) need to be supported to encourage more women to participate in dairy businesses. Projects also need to have women specific interventions, for example giving women the priority in certain project implementation aspects.

Short project duration – Many developmental projects have been criticised for their short cycle; this has been the case with DairyProfit. All the project interventions used a market systems approach and were on the path towards sustainability. Nevertheless, the short implementation duration meant that the outcomes at the closure of the project were still a long way to reach financial and managerial sustainability. However, the implementing partners actively collaborated with different partners (public, private sector and civil society organisations active in dairy sector) to make the required follow-up and continue DairyProfit activities. Some of the youth have rolled over into new a



project called COWDISH, which will strengthen their operations until their enterprises mature. ICT platforms have also not reached commercial sustainability yet, given the lengthy processes involved in software development, technical appraisal, testing and trials, but there is clearly a business case for these applications in the dairy sector, and the local partners are determined to work them towards commercial sustainability.

Limited (local) technical capacity – This affected mostly the fodder processing equipment where the initial plan was to mobilise innovations from within the country and further develop the equipment locally. Within the first six months of the project, it was clear that the local industries had no capacity to make the equipment due to the profiles of the metal used. This therefore meant that the model of implementation had to be changed in such a way that the results anticipated by the projects would still be achieved. The main outcome under this was to address the constraints of maize silage business that was being implemented by the youth, and to make maize silage more accessible and affordable for use by dairy farmers.

## Conclusions and recommendations

This brief discusses the insights from the DairyProfit project on youth empowerment. It is worth mentioning that the project was implemented in Kenya, Tanzania, Ethiopia; however, the present brief only reported activities in Kenya. The project was very suitable as its result areas were accurately in line with the priorities of dairy in the country. This alignment is a key contributor to the success of the project. Given that Kenya is the African hub for digital solutions for agricultural transformation (CTA, D4Ag report 2019), the incorporation of ICTs in dairy among the youth has proved to be a timely investment. It is recommended that the incorporation of mechanisation and digital tools can attract youth participation in dairy activities. The project had a strong emphasis on skills training, especially for fodder entrepreneurs, but the financing environment was constrained and as such, they could only do as much as they could afford. The insight here is that any project that is meant to boost entrepreneurship as part of their results should be packaged with a financing facility either within the project or should work with a financing partner. Though the project had a grant, the grant was strongly associated with the baling innovation. Future projects should include financing options beyond innovation grants.

Though the youth might have interest in operating as dairy farmers, most of them are resource and skills limited. Future projects are recommended to support youth as technical advisors, skilled farm employees within commercial dairy activities and put much emphasis on capacity development for out-of-school youth to become employable in the dairy sector. Finally, even though the project was launched as inclusive, the participation of women was very low, therefore there is a need to look into gender sensitive innovations.

## References

- Andeweg, K., van der Lee, J., & Bashuna, S. D. (2020). Youth as an asset for dairy development: What have we learned from youth-led dairy initiatives in East Africa?. Wageningen University & Research.
- Digitalization for African Agriculture Report (2018-2019), Technical Centre for Agricultural and Rural Cooperation, Available at: <https://www.cta.int/en/digitalisation-agriculture-africa>
- FAO (2019). Rural youth employment and agrifood systems in Kenya, A rapid context analysis, Rome, FAO. (Available at: <http://www.fao.org/3/ca7341en/CA7341EN.pdf>)
- Feed the future (2018). Enhancing Investment attractiveness in Kenya's dairy sector: Policy Brief, Nairobi Available at: [https://climatefocus.com/sites/default/files/brief\\_3\\_-\\_enhancing\\_investment\\_attractiveness\\_of\\_kenya\\_dairy\\_sector.pdf](https://climatefocus.com/sites/default/files/brief_3_-_enhancing_investment_attractiveness_of_kenya_dairy_sector.pdf)
- Kenyan Dairy Board (2019). Presentation on Kenya Dairy Industry: Status and Outlook: Available at <https://dairy africa.com/afda/wp-content/uploads/2019/08/MARGARET-KIBOGY.pdf>
- Perfometer Agribusiness (n.d) Technical Project Completion Report (unpublished)
- Sitawa, M., Mugasia, E., & Songoro, A. (2016). Challenges faced by youth engaging in agriculture. A study of peri-urban Kiambu in Kenya. GRIN Verlag. <https://www.grin.com/document/343332>

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*Members of Upendo Youth Group, Nakuru, cleaning up overgrown vegetation around their fish pond.*





## Supporting and Scaling Up Youth Agripreneurship in Kenya

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