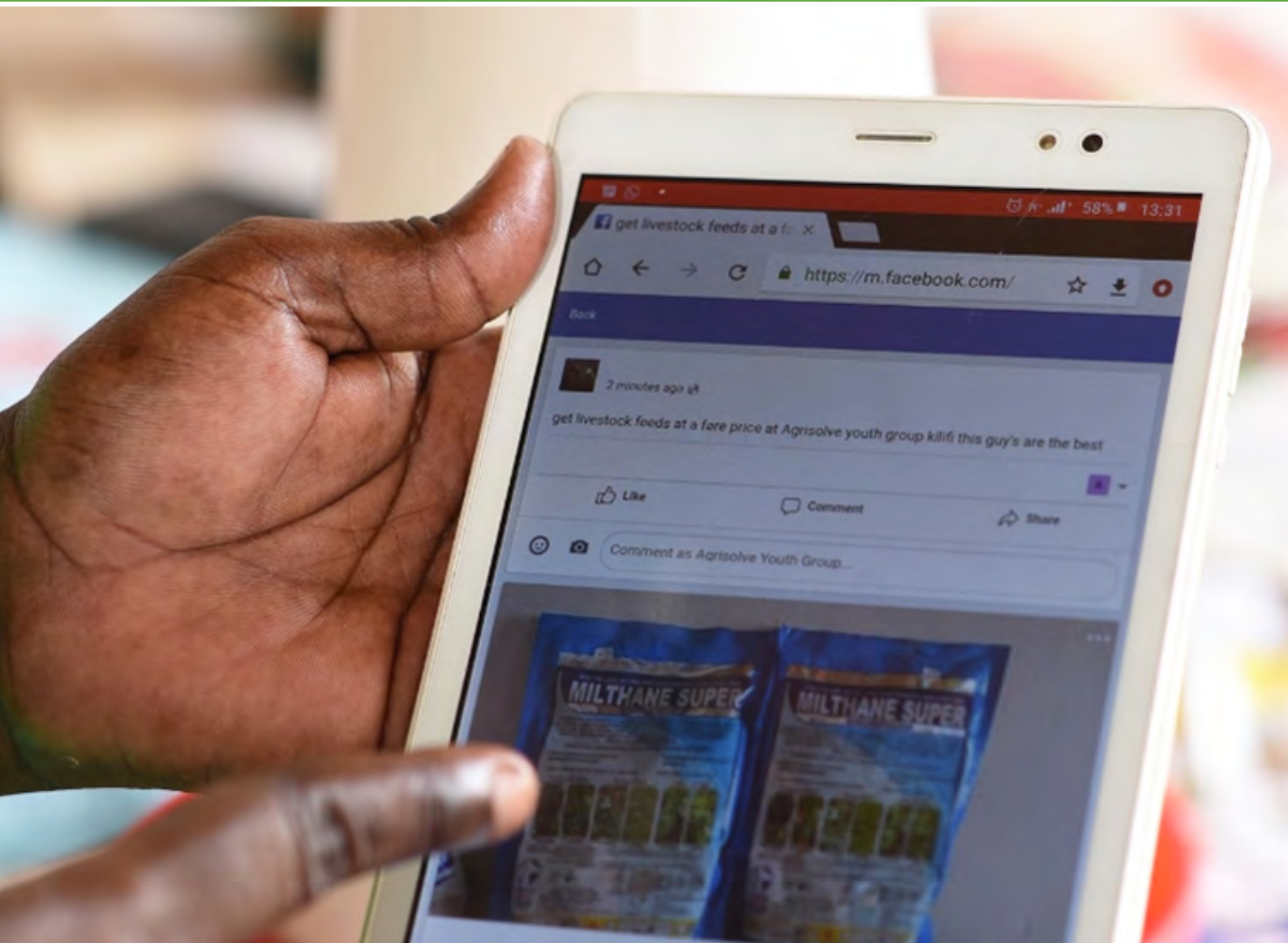


# ICT USES BY RURAL YOUTH IN KENYA





# **ICT uses by rural youth in Kenya**

**Perspectives from the Vijabiz project**

(Working document)

**Prepared by**

Richard Wahiu, Ken Lohento and Folake Koutchade

**Youth Economic Empowerment through Agribusiness in Kenya (Vijabiz) Project**

Mainly funded by IFAD

Co-funded and co-implemented by CTA and USTADI

August 2020



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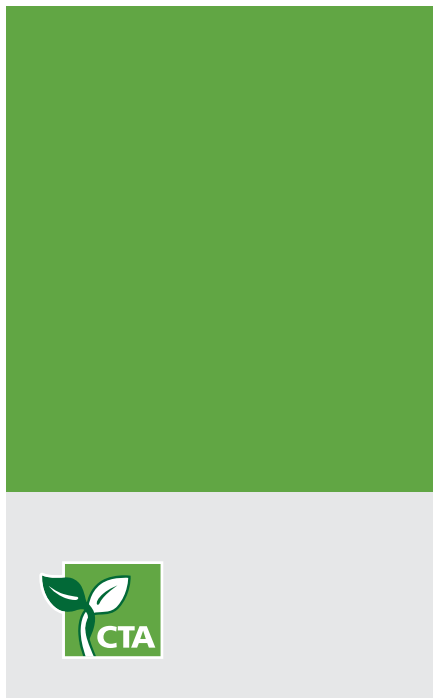
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# ACKNOWLEDGMENTS

This study was produced by the Youth Economic Empowerment through Agribusiness (Vijabiz) project, with the support of Richard Wahiu, Consultant.

CTA staff that led its production are Ken Lohento and Folake Koutchade, with inputs from Michael Kermah (CTA Consultant). USTADI staff who contributed are George Mazuri, Eric Bosire, Noel Kasololo, Morgan Siguda, Karemba Mweni.

The study has benefited from the participation of the County Government staff in Kilifi and Nakuru, Vijabiz youth group leaders; services providers such as ICT4Development and Institute of Advanced Technology; ICT sector experts and software developers working to support the agriculture sector and all the groups that invested time and resources to participate in the survey.

We are grateful for the contribution of many that have helped respond to the study objectives.





# ACRONYMS

<b>CA</b>	Communication Authority of Kenya
<b>CEC</b>	County Executive Committee Member
<b>CTA</b>	Technical Centre for Agricultural and Rural Cooperation
<b>EAGC</b>	East African Grain Council
<b>FAO</b>	Food and Agriculture Organisation
<b>GDP</b>	Growth Domestic Product
<b>GSM</b>	Global System for Mobile Communications
<b>ICT</b>	Information Communication Technology
<b>IFAD</b>	International Fund for Agricultural Development
<b>KALRO</b>	Kenyan Agricultural and Livestock Research Organization
<b>KES</b>	Kenya Shillings
<b>KII</b>	Key Informant Interviews
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>MSME</b>	Micro, Small and Medium Enterprises
<b>SMS</b>	Short Messaging Services
<b>SPSS</b>	Statistical Package for Social Scientists
<b>UNDP</b>	United Nations Development Program
<b>USSD</b>	Unstructured Supplementary Service Data
<b>Vijabiz</b>	Youth Economic Empowerment through Agribusiness





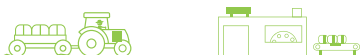
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# 1. EXECUTIVE SUMMARY



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The agricultural sector is a key growth area for the socio-economic transformation of Kenya and Africa. The sector is a focus area under the Kenya medium-term plan - the *Big Four Agenda* as well as the long-term plan *Vision 2030*. Food security and manufacturing link directly to agriculture and are central to both the *Big Four Agenda* and *Vision 2030* plans. These plans consider Information Communication and Technology (ICT) critical enabler of the development goals of the sector.

Kenya like most of Africa has registered significant growth in the access to mobile phone- registering a 271% growth over a 10-year period according to Communication Authority of Kenya (Annual Report for the Financial Year 2018-2019). Access to the internet through the mobile phone contributes to 99% of all internet subscriptions in Kenya according to industry statistics.

The Government of Kenya in its digital economy strategy is seeking to entrench the use of ICT for business and public service delivery. This aligns with the interventions that CTA pursued in Vijabiz project and promotes the goal of mainstreaming the use of ICT in the agribusiness in line with the government's strategy.

**91%**  
**Proportion of the youth enterprises using social media and ICT**

**The youth businesses show low levels of technology adoption**

This study was commissioned to establish youth groups' access and use of different ICT and social media in agribusiness activities. The study also sought to assess the gaps and barriers affecting the use of ICTs by the supported groups. **ICTs are considered in this study as any digital technology that facilitates access to, processing and dissemination of information.** This includes the mobile phone, the computer, software including basic editing tools, the internet, satellites, digital radio, digital video, social media platforms such as Facebook and Instagram, etc.

In previous studies by CTA on digitisation of agriculture, it was established that digital tools can improve market efficiency, transparency, aggregation, and integration of value chains. This alongside the investment in physical infrastructure is poised to spur growth in agribusiness<sup>1</sup>. Other studies, including some by Food and Agriculture Organisation (FAO), have found that through ICT, smallholder farmers access technological tools, input supply, extension services, markets and market prices, financial services among other essential resources.

Similarly, this study has established that there is increased appreciation of the role of ICT in agribusiness. From the results of this survey, 89% of the sample reported they had attended the Vijabiz project sponsored ICT training and **all the survey participants considered access to ICT as either indispensable or useful for their advancement in the agribusiness activities.** The proportion of enterprises using social media and ICT in general has gone up **from 25%** at the baseline stage (during recruitment and entry into the Vijabiz project) **to 91%** after exposure to the ICT training and supported agribusiness activities.

Further, the supported youth agribusinesses are using ICT to conduct digital marketing, receive information and advisory services, send, and

receive money, buy, and sell products. However, there is limited use of some farm management applications and other ICT-based that may promote production, marketing, and business management. Access to internet by the youth agribusinesses is largely through a smartphone. On access of internet for agribusiness purposes, 99% of youth groups indicated they used mobile phones while 29% used computers. This is due to growth of mobile phone technology penetration in the country over the past years.

Besides access to social media and general communication, the mobile phones are used supported youth agribusinesses to send and receive payment through mobile money applications such as M-PESA. Computers on the other hand were used mainly for recording keeping especially the use of spreadsheets to enumerate business transactions.

Within the Vijabiz project businesses were supported to adopt ICT through training and other initiatives that promote adoption of ICT. This has been reported to have positively impacted on the youth as they have embraced digital marketing, online advertising, and access to information. Over 90% of the survey sample agree that knowledge and skills and use of ICT have increased business visibility, increased sales, and number of clients which has increased sales volumes.

Cost of ICT devices (63%), high cost of internet subscription (60%), poor and unreliable connectivity (58%) especially in rural areas where the Vijabiz project was implemented are the main hindrances for adoption of digitalisation according to youth. Lack of skills on how to use the internet and social media for agribusiness affects the use of ICT by the youth in agribusiness. The businesses that are mainly constituted of youth members from low income background and low level of formal education showed low levels of technology adoption. Usage of ICT was found to be affected by literacy and technology knowledge and skills.

<sup>1</sup> <https://www.cta.int/en/digitalisation-agriculture-africa>





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Kenyan ICT developers have premiered several mobile-based applications that target the agriculture sector. However, the key informants argue that limited support to youths in agribusiness is affecting full exploitation of digital solutions in agriculture. Change of business model that should involve co-opting some tech-savvy youth in rural areas to act as agents to deepen the usage of ICT solutions is recommended.

The scale and market scope of a business was also found to affect the level and intensity of ICT use. Provision of value-added products and targeting customers beyond their locality have been identified as motives for high degree of usage of ICT within the rural youth businesses. Therefore, youth businesses with no branded products that target markets within their rural set up had the weakest use of digital technologies.

To address the challenges faced in adoption of ICT use by agribusinesses, the youth recommend that **government should develop and expand rural infrastructure** to enhance reliable connectivity (79%), develop digital or ICT training programs (73%) and facilitate the access of digital equipment for the users (60%). It is recommended that the government provides policy framework that promotes growth of the ICT sector especially instituting taxation measures that lower the cost of hardware and internet services. **Private sector ICT service providers** must lead ICT development and ICT roll out initiatives.

The study recommends institutionalised support to promote the adoption of ICT by youth and other rural-based agribusinesses. Increased capacity building and supported enterprise scale-up to achieve commercial viability levels will help the youth realise the full benefits of ICT use. **Some findings of the report also suggest that proactive action to improve young rural women capacity in the use of digital tools may be needed** to ensure inclusive rural transformation.







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## 2. INTRODUCTION



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### 2.1 Background

The Youth Economic Empowerment through agribusiness in Kenya (VijaBiz project) is a two-year project, mainly funded by International Fund for Agricultural Development (IFAD) and co-funded by the implemented partners Technical Centre for Agriculture and Rural Cooperation (CTA) and Ustadhi Foundation. CTA and Ustadhi Foundation collaborated to conceive and implement the project's activities.

The project aimed at addressing key challenges facing the youth in agriculture. More specifically, it builds entrepreneurship capacity for about 163 youth agribusiness groups (around 2,300 youths aged 18-35 years old, with at least 30% women) in cereals, dairy and fishery value chains in the Kilifi and Nakuru counties of Kenya.

After one and half years of implementation, CTA and Ustadhi Foundation launched a survey find out the use of Information Communication Technologies (ICTs) by the supported youth groups in Kilifi and Nakuru counties to undertake various business and group related activities.



The survey sought to establish how the youth groups were involved in the Vijabiz project use digital technology; assess their needs, and better help them to use digital tools. The online survey was distributed to all groups through SurveyMonkey tool to assess the various areas that demonstrate the appreciation and use of ICTs by youth beneficiaries. The survey results from youth leaders with one response per group. CTA lead the implementation of this study and Ustadhi Foundation supported on the ground implementation activities.



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## 2.2 VIJABIZ YOUTH ICT USE STUDY OBJECTIVES

The overall study objective was to establish the use of ICTs by youth beneficiaries of the Vijabiz project. The specific objectives included the following to;

- Establish youth groups' access and use of different ICT and social media in their agribusiness activities.
- Identify impacts of ICT training sessions organised.
- Define gaps, barriers and challenges youth experience when using ICT in agribusiness.
- Map out the role of various stakeholders, notably the government, in strengthening the usage of digital technologies in agriculture for Kenyan youth.

## 2.3 ICT USE STUDY METHODOLOGY

Mixed methods research design was used in this study. A quantitative research method was supported with qualitative data collection. Literature review was conducted to provide the situational analysis and the context of ICT related developments in Kenya that may influence the survey results.

The summary of the methodology has been presented in the next subsections.



### 2.3.1 Quantitative survey

CTA and Ustad Foundation launched a quantitative survey in January 2020 to assess the use of ICT services among the Vijabiz project supported youth groups in Nakuru and Kilifi counties. The survey, constituted of close-ended and open-ended questions, was launched through an online survey platform (SurveyMonkey). The survey targeted and was available to all through the online platform. From a total of 163 groups that were retained from the beginning of the projects 75 businesses responded to the survey by the end of February 2020. The sample of groups show characteristics that largely mirror the retained groups and are representative of the project supported groups. The structured survey instrument used during this survey is appended to this report.

The survey had some limitations which CTA and Ustad Foundation mitigated through various measures. Online surveys, especially when they are targeting rural populations, usually have low response rates. To mitigate this, CTA sent invitations to participate to all groups. The communication about the survey had a hyperlink that youths would use to access and respond to the survey. Reminders to emphasise the need to participate were sent regularly. Communication messages about the survey were among others shared on the Vijabiz project's WhatsApp groups where the youth enterprises are connected and interact.

The project implementation teams in the counties also intervened during their face to face interactions and encouraged the groups to take part in the survey.

Unstable internet connectivity interrupted the access to the online survey. Therefore, there were duplicated entries, with some being incomplete. These incomplete cases were removed during the data cleaning and only one response per group was retained (the completed questionnaire).

The data collection period ran for more than a month to allow many groups to participate in the survey. The study incorporated qualitative interviews to build on the survey results and bridge any information gaps.



### 2.3.2 Qualitative key informant interviews



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Qualitative data were gathered to supplement the quantitative data collected through the online survey. Qualitative data collection methods are essential in addressing gaps in data and provide context of the survey findings. Qualitative Key Informant Interviews (KII) with purposively selected respondents was conducted.

KII with actors working in the agricultural sector, youth agribusiness matters and use of ICT in agriculture were conducted after the survey. These included the county government staff who had worked with CTA and Ustadhi Foundation to implement the Vijabiz project. County government staff in charge of livestock, cereals and fisheries as well as youth development officers were targeted. To enrich the results the study also sought the opinion of experts in the ICT sector especially those informants working with the youth to promote digital solutions targeted at the youth in agribusiness.

A total of 31 key informants with diverse groups were interviewed to enrich the results on technology use in agribusiness at county level and national level. Vijabiz youth group leaders were purposively selected to include those with demonstrated use of ICT in agribusiness and those who have not shown significant adoption of ICT during the project implementation stage.

The length and context of each discussion was themed around the area of experience with subject matters. The table below shows the distribution of purposively selected informants-this is not meant to draw a representative sample but to build and enrich the information around the study objective.



**Table 1: Listing of key informants' interviews**

Key informant category	Kilifi	Nakuru	Other	No. of KI
Project implementation team (Ustadi Foundation Staff)	1	1	2	4
Vijabiz Youth groups leaders	5	5		10
ICT training providers & software developers, ICT-agribusiness informants	1	1	3	5
County government teams -Cereals, dairy & fisheries value chains	3	4		7
Cereals, dairy, fisheries value chains	1	1	3	5
<b>Total actors interviewed</b>				<b>31</b>

Most of the interviews were conducted through telephone and a few conducted through web-based video meetings solutions including Zoom and Google Meet. This was to overcome the limitations of face to face meetings during the period when COVID-19 spread control measures, social distancing and cessation of movement across counties were in place.

The interviews were conducted during the analysis stage of the survey data to specifically fill gaps and to enrich the survey results. A qualitative interview discussion guide was developed to collect information needed. The interview guide is attached as an annex to this report.

### 2.3.3 Data analysis

Qualitative interview notes were taken down and trends analysed to arrive at conclusion of the youth groups use of ICT. The summaries from qualitative interviews were cross analysed with the quantitative data and contextual secondary data on the ICT usage in agriculture was analysed to build up evidence needed for the report.

Quantitative data was analysed through quantitative analysis computer software-Statistical Package for Social Scientists (SPSS) to bring out similarities and difference between sub-groups within the survey sample. Quantitative data has been presented in charts and frequency distribution tables. In most cases, most of the data showed similar responses across the groups in different value chains, Kilifi and Nakuru and across the gender of the respondents.

Supporting qualitative verbatim responses have been used as add-on evidence to the quantitative results.







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## 3. STUDY FINDINGS



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### 3.1 Situational analysis of ICT use in agriculture in Kenya

This section presents a review of the agricultural sector, its contribution to the Growth Domestic Product (GDP) and job creation and youth participation in the sector. The section also reviews the enterprises use of ICT and specifically the use of ICT in the agricultural sector.

#### 3.1.1 Youth and agriculture in Kenya

Agriculture in Kenya is the highest contributor to the county's GDP. According to the Kenya National Bureau of Statistics (KNBS) Economic Survey 2020, agriculture contributed 34.1 per cent to the country's GDP<sup>2</sup> and a further 27 per cent indirectly through its linkage with other sectors<sup>3</sup>. Agriculture employs 40 per cent of Kenya's population<sup>2</sup>. The Vijabiz project focuses on agriculture is therefore relevant and links the youth directly a sector with opportunities.

<sup>2</sup> Kenya National Bureau of Statistics Economic Survey 2020

<sup>3</sup> The agricultural sector in Kenya- Food and Agricultural Organization



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# 70%

**Size of agriculturally productive land in Nakuru County**

The project focus on cereals, dairy and fisheries is confirmed to be in line with the growth areas in the agriculture sector. The KNBS Economic Survey 2020 shows that;



**65%**

Agriculture contribution to export earnings



**KES 3.4B+**

Amount from fish contribution



**KES 500M+**

Amount from maize contribution



**668.2M**

Volume of milk supplied to processors in 2019

*\*has been on the rise.*

*KNBS Economic Survey, 2020*

According to the United Nations Development Program (UNDP)<sup>4</sup>, the average age of a Kenyan farmer is 60 years. However, the role of the youth is not to be downplayed and many studies have pointed out that young people are key to the transformation of the sector. According to the Kenya 2019 Census report, the youth (18 to 34 years) represent 29 per cent (13,777,600) of Kenya's population.<sup>5</sup> A significant proportion of this economically active population is however either unemployed or underemployed. The youth make up 64% of the unemployed in the country with a 40% unemployment rate<sup>6</sup>.

This, therefore, makes a case for initiatives that promote youth participation in agriculture. Kenyan youth have so far shunned the viability of agriculture as an area to venture into because of the use of traditional methods and poor remuneration.<sup>7</sup> The Vijabiz project targeted youths who mostly had not been included in the agricultural value chains in the past to spur their interest and incomes from the sector.

In Nakuru, agriculturally productive land makes up for at least 70 per cent of the county. According to the Nakuru county government, Nakuru has the potential to produce at least 500,000 tonnes of maize annually. Currently, maize sales are valued at KES 2.91 billion annually. On the other hand, the dairy sector records sales of over KES 88 million annually and the fisheries sector records over KES 141.9 million annually. The dairy sector in Nakuru is estimated to generate approximately KES 8.8 billion per year<sup>8</sup>. In Kilifi agriculture contributes to 52.7 per cent of household income.

Around 78.5 per cent of the population depends on agriculture as the main source of income. Fishing moves at least 400,000 tonnes annually and the dairy sector has sales over KES 1.14 billion. Kilifi county annually produces dry maize valued at KES 700 million and 145 million worth of cowpeas<sup>9</sup>. These two counties, therefore, are relevant to the project activities targeted at cereals, dairy and fisheries value chains.

4 <https://www.ke.undp.org/content/kenya/en/home/ourwork/inecgr/successstories/cultivating-youth-entrepreneurship-through-agribusiness.html>

5 Kenya National Bureau of Statistics, Census 2019 Report.

6 Cultivating youth entrepreneurship through agribusiness- United Nations Development Programme Kenya

7 Ministry of Agriculture, Livestock and Fisheries, Kenya Youth Agribusiness Strategy 2017-2021.

8 County Government of Nakuru- Ministry of Agriculture

9 Kilifi Climate Risk Profile- International Sector for Tropical Agriculture

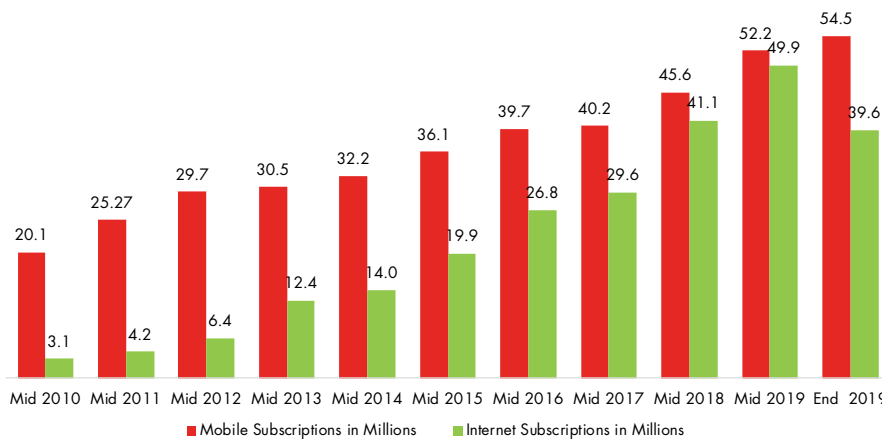


### 3.1.2 Growth in the ICT sector in Kenya

This section of the report analyses the ICT infrastructure that is currently available in Kenya. The ICT landscape has experienced tremendous growth over the last decade. There has been a steady growth in both the subscription to mobile and internet services in Kenya. The number of mobile subscriptions has grown by 271% between 2010 to the end of 2019 to reach 54.5 million subscriptions.

Over this period the mobile internet subscriptions have grown by 1277% to reach 39.6 million<sup>10</sup> compared to just 3.1 million in 2013. This growth has created opportunities for the population and business to communicate more efficiently and provided a window for e-commerce. Accessibility to mobile phone and growth in mobile internet usage is, therefore, an opportunity for youth in agribusiness. The Vijabiz project interventions through training and equipping youths with digital skills among the other project activities are in line with the socio-economic realities that exist in Kenya. The figure below shows the trend of growth of ICT services over 10 years period (2010-2019).

Figure 1: Subscription of ICT services (population in millions)



Source: Communication Authority Annual Report for the Financial Year 2018-2019 (2020)

The growth in the telecommunication sector has brought about a change in communication and access to information. It has modernised the way the population and specifically the youth interact, socialize, and conduct business. There are new business opportunities that are emerging according to key informants who indicated that the youth who traditionally would shy away from agriculture has taken interest particularly in value addition and marketing of agricultural produce using ICTs.



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<sup>10</sup> The definitions and methodologies of collecting and reporting telecommunications/ICT indicators was changed by industry regulator during this reporting period which saw reduction in numbers instead of increment in the subscriptions



### 3.1.3 Government of Kenya ICT Strategy

A review of the policy and ICT strategies being promoted by the government has identified a few initiatives that aligned to the expectations of the Vijabiz project youth enterprises. The government in 2019 developed a *Digital Economy Blueprint*<sup>11</sup> which spells the road map for the growth of the ICT sector. The blueprint provides a window for the rollout of innovative agri-based digital enterprises through expanded access of government services from a one-stop portal for several services (e-citizen), expansion of infrastructure including national fibre optic line and recent commercial agreement **with Google Loon to spread 4G network to rural areas**. Loon has

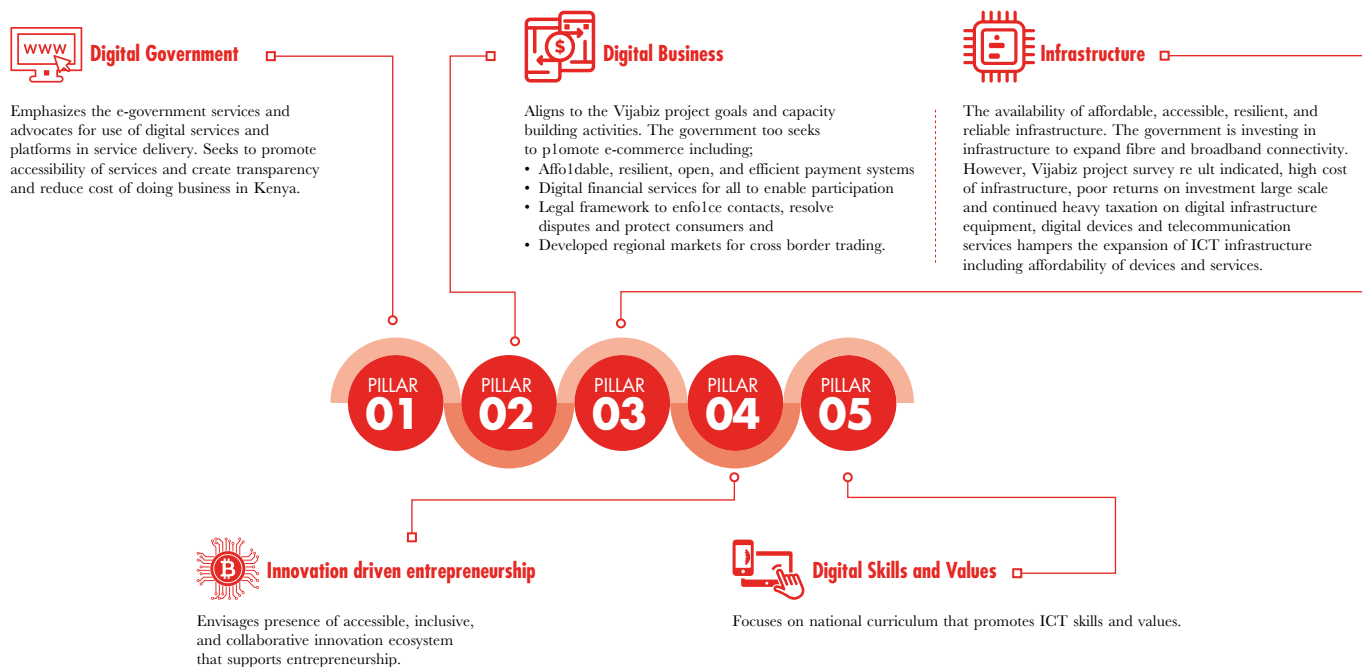
launched the agreement to cover the population in rural areas that lack internet infrastructure. The solution makes it possible for mobile network operators to cover rural populations, unlocking new customers and business opportunities.

Partnerships and capacity building initiatives to build ICT skills among users is also an area of focus by the government. The shift by the government to offer most of the services including business registration, digital national identity cards and passports, tax registration and payment, registration of education services, asset registration, online payment for licences and fees has made a significant

population appreciate the use of ICT to transact business from both the public and private sector. Cashless payment systems supported by the growth in mobile money and digital financial services and products by the banking and insurance institutions have created opportunities for e-commerce in agriculture and the wider economy.

The blueprint's 5 pillars are in line with the Vijabiz project ICT goals and interventions. If fully implemented the government may through the strategy address the expectations set forward by the youth interviewed in this survey. The figure below is the summary of the five pillars that form the strategy.

Figure 2: Kenya digital economy strategy summary diagram



Source: *Digital Economy Strategy 2019, Government of Kenya*

11 <https://www.ict.go.ke/wp-content/uploads/2019/05/Kenya-Digital-Economy-2019.pdf>



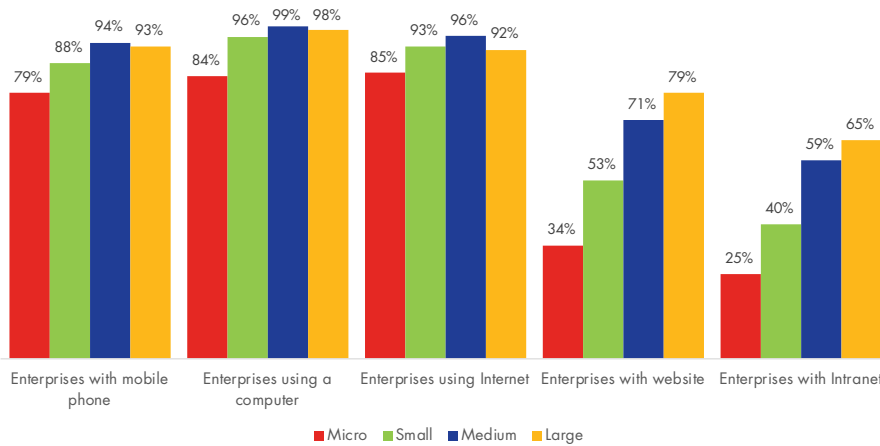
While the implementation of digital literacy projects has faced delays and shortfall in funding the programs have the potential to address future youth agripreneurs ICT knowledge and skill gaps. With the emergence of **COVID 19 pandemic**, the government facilitated a commercial deal between Google’s sister-company Loon and Telkom Kenya-one of the local telecommunication services provider, to deliver connectivity to the rural and remote areas of the country.

The initiative is aimed at facilitating communication and satellite internet connectivity in rural areas that lack fibre optic and 4G GSM infrastructure coverage. In the wake of restricted movement, closure of schools and businesses this is likely to enhance reach connectivity through a 4G network for rural areas and provide users with fast and reliable internet connectivity.

### 3.1.4 Enterprises ICT uses

Previous studies show that enterprises are using ICT to fulfil diverse business needs. A 2016 study of enterprise usage by the industry regulator Communication Authority of Kenya (CA) and KNBS shows widespread access and entrenched use of ICT by different sizes of enterprises<sup>12</sup>. Access to mobile phones, computers and the internet is the widely used ICT technologies by businesses. In terms of access, the 2016 survey showed similar results to the Vijabiz project enterprise survey with comparable results on mobile phone and internet usage for businesses of similar profiles.

Figure 3: Enterprises Access to ICT



Source: CA and KNBS Enterprise ICT Study (2016)

12 Micro (1-9 employees), small (10-49 employees), medium (50-249 employees) and large (250 or more employees)

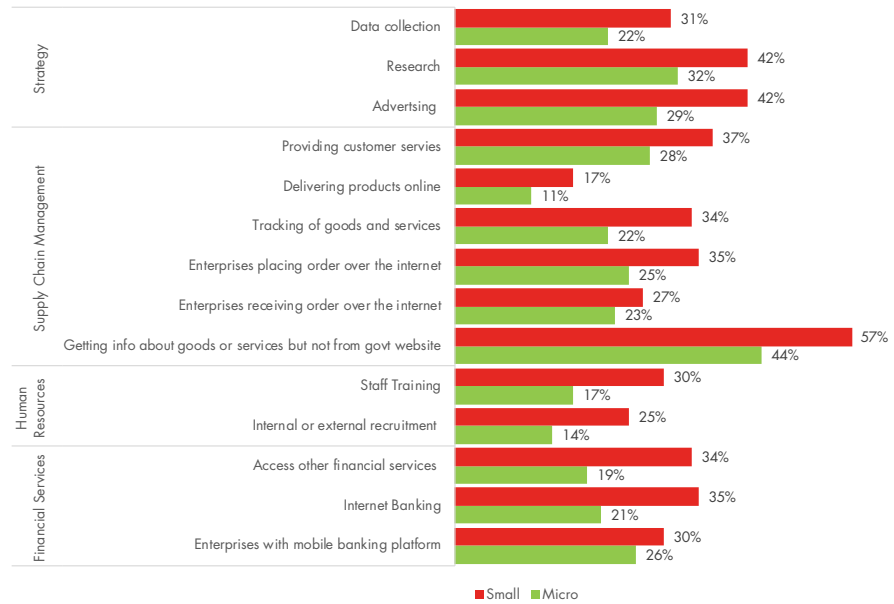




### 3.1.5 ICT usage by micro and small businesses in Kenya

The micro and small enterprises in Kenya have previously been found to be using ICT to foster business growth, communicate and service their customers. Though lower than the medium-sized and large enterprises, micro and small enterprises are embracing e-commerce and are using ICT for supply chain management, to access financial services and to do advertising and research.

Figure 4: ICT Supported business transactions-Communication Authority Survey 2016



Source: CA and KNBS Enterprise ICT Study (2016)



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### 3.1.6 ICT uses by youth in rural areas

Like in many other developing countries, there is a considerable digital divide with urban population recording higher access to technology compared to the rural populations in Kenya. This difference has previously been attributed to the rural's population level of education and income.

In recent years, however, limited access to ICT and electricity infrastructure are major factors of exclusions of populations from the digital economy<sup>13</sup>. This, however, is changing as more rural households continue connecting to national grid and access to solar equipment especially mobile phone solar chargers that are on the increase in rural areas.

Therefore, the lack of electricity in rural areas cannot be discounted as one of the main factors that explain the persistent urban-rural digital divide. Other factors that might account for the high divide include a lack of digital skills and affordability issues, which are more persistent in rural areas.

The roll-out of mobile-based internet connection provided by GSM telecommunication providers is accelerating the rate of acquisition of adaptable mobile phone internet as may be shown by the statistics of mobile-based internet subscriptions shown in Figure 1 above.

The dividends of the growth in ICT is more likely to benefit more youth as opposed to the older generation users. First, most of the Kenyan population are youth. Secondly, in rural areas and especially in the agricultural sector, previous studies including a CTA<sup>14</sup> survey have shown that users under age 35 years who are digitally savvy, are likely to be beneficiaries of these developments. The youth will therefore generally continue to drive usage of ICT in rural areas and particularly in agriculture.

<sup>13</sup> <https://blogs.worldbank.org/digital-development/electricity-and-internet-two-markets-one-big-opportunity>

<sup>14</sup> <https://www.cta.int/en/digitalisation-agriculture-africa>





### 3.1.7 ICT uses in agriculture

One of the important factors the Vijabiz project leveraged upon to accelerate the success of the youth agricultural enterprises is ICT. The accelerated technology growth in Kenya just as the rest of Africa economies is fuelled by access to the mobile phone. The near-universal access to the mobile phone is projected to be reached in a couple of years. Consequently, the use of ICT for business is also on the rise. It was, therefore, necessary to review the current use of technology in agriculture.



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Agriculture in Kenya faces different challenges, among them- use of outdated technology, climate change, disease and pests, infrastructure and soil nutrients<sup>15</sup>. However, ICT is an important addition to agriculture and has a great contribution to the agricultural value chain and a catalyst for resolving the sector's challenges. ICT has in the past been used across sectors to spur growth through efficiency. It has eased access to information to aid decision making and to facilitate learning. Modern and traditional media including radio has demonstrated immense power to transform farmers access to information. ICT innovations have therefore built on to this.

Other studies including some by Food and Agriculture Organisation (FAO) have established that through ICT, smallholder farmers access technological tools, input supply, extension services, markets and market prices, financial services among other essential resources. Agriculture being a crucial sector in Kenya, ICT-based interventions present an opportunity to growing the economy and more important the job creation for a youth majority. Through ICT a lot of challenges presented by traditional agricultural practices are bridged. Information asymmetry that characterises traditional agriculture is bridged through ICT.

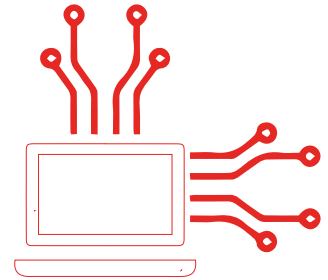
15 Challenges facing agriculture in Kenya-Kenya Agricultural Research Institute (KARI)



There has been a myriad of interventions by stakeholders in Kenya to integrate ICT in agriculture. The interventions cut across many sectors which are part and parcel of the agricultural sector and support the agricultural value chain.

Below are some few that have demonstrated impact on the Kenyan agricultural landscape.

- **Safaricom M-PESA** (<https://www.safaricom.co.ke/>) has generally been acknowledged as the first mobile money platform in the world. The service was first started to tap the many unbanked to receive payment and for foster remittances between people. The service has since evolved to cater for saving needs, a payment platform for goods and services, international remittance, offer credit services, and a tool for integration of mobile money to banking services. M-Shwari<sup>16</sup> - a paperless banking service that is offered through M-PESA platform and leverages 22.5 million M-PESA subscribers is also now offered. It is one of the notable innovations cutting across the socio-economic aspects of Kenyans, and a valuable platform for the actors in agricultural value chains.
- **Mkulima Young** (<https://www.mkulimayoung.com>) is the pioneering youth-led agriculture digital platform that connects young farmers with markets. It also provides online publication and documenting services, inspiring farmers and agriculture support institutions. Apart from its website, it heavily uses social media such as Facebook and Twitter for this purpose. The Vijabiz project has partnered with that platform to increase support access to profitable market to youths.
- **Safaricom DigiFarm** (<https://www.safaricom.co.ke>) is modelled to fulfil farming actors' knowledge on farming practices, access to quality inputs, ease access to financial services, both credit & insurance and access to produce markets, DigiFarm has over a million registered users. From farmers, off-takers, traders and retailers, M-PESA has supported agriculture over the past decade with about 50% of farmers in Kenya using M-PESA<sup>17</sup>. Safaricom has since introduced DigiFarm an integrated financial services platform for farmers in Kenya. Other players including Twiga Foods, Meru Greens, have also capitalised on technology to create linkages between the farmer and the market.
- **KALRO Big Data Project** - The Kenyan Agricultural and Livestock Research Organization (KALRO) in partnership with World Bank is putting up Big Data Infrastructure in Kenya that will see a growth in ICT use in Agriculture. This platform will help address challenges like Climate Change through availing information on climate and weather patterns.<sup>18</sup>
- **FarmDrive** (<https://farmdrive.co.ke>) is a company that uses mobile phones, alternative data, and machine learning to close the critical data gap that prevents financial institutions from lending to creditworthy smallholder farmers. It facilitates access to finance to smallholder farmers through your mobile phone, using credit scoring. It also provides financial institutions with services that can help them efficiently mitigate risks.
- **CROPMON** - Has helped farmers (mostly maize farmers) access information on farming best practices through mobile phone applications. Farmers would access data such as 7-day weather forecasts, weekly reports of crop progress and farm management recommendations.<sup>19</sup>



<sup>16</sup> <https://www.safaricom.co.ke/personal/m-pesa/do-more-with-m-pesa/loans-and-savings#:~:text=M%2DShwari%20is%20a%20paperless,or%20fill%20out%20any%20forms>.

<sup>17</sup> Mercy Corp AgriFin 2019- <https://www.mercycorpsagrifin.org/2019/05/27/building-the-digifarm-innovation-platform-the-journey-to-one-million-farmers/>

<sup>18</sup> Kenya Agricultural and Productivity Project, 2019- <http://documents.worldbank.org/curated/pt/656601553621618378/pdf/Kenya-Agricultural-Productivity-Program-KAPP-I-and-II.pdf>

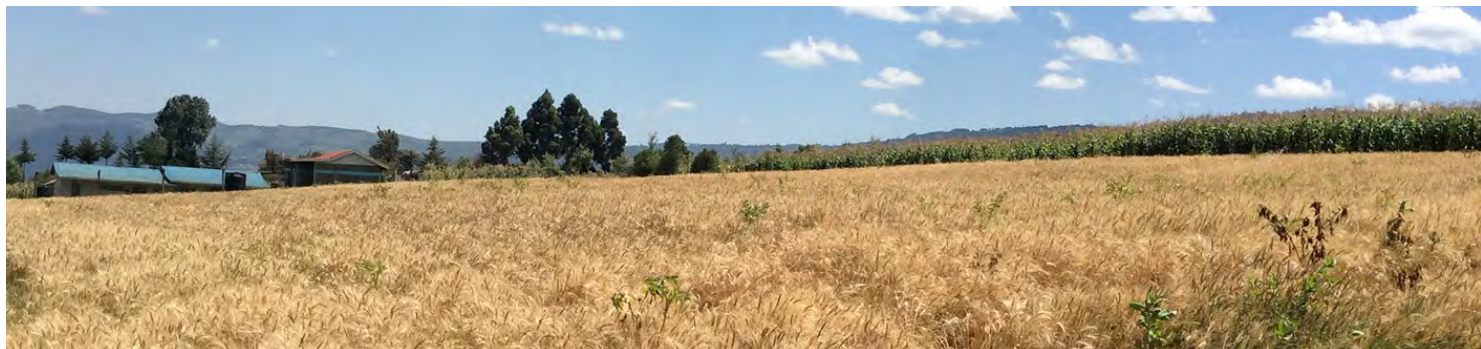
<sup>19</sup> Agrocares, CROPMON Project <https://www.agrocares.com/en/cropmon>



- The digital platform **G-Soko** of East African Grain Council (EAGC) (<http://g-soko.com>), that offers a network for automated grain warehouses linked to a virtual trading platform and banks. It has aided EAGC to monitor grain levels in their warehouses and ensure quality grain is stored in the warehouses.<sup>20</sup>
- iCow (<https://icow.co.ke>) is a platform that has been used to increase the yield for dairy farmers in Kenya. Using USSD codes, farmers can access a 'library' of farming best practices. It also gives a calendar feature for livestock. The calendar contains information on gestation cycles, vaccination cycles and growth cycles.<sup>21</sup>
- Other **agricultural ICT solutions** - there are several platforms that enable the integration of all value chain players in agricultural production through farmer and actors registration, produce procurement, aggregation, warehousing, quality and standard verification and transportation of the product to end consumers either locally or for export markets. Some of the solutions offer users smart cards, mobile applications, and automated reporting services. These technologies offer transparency across the value chain to reduce fraud, enhance farmer loyalty, and ensure an increase in quality and quantity of products within the value chains.

Despite the myriad of opportunities that ICTs offer in agriculture, ICTs have not been exploited to its full potential. Some of the reasons given include insufficient capacity in e-agriculture entrepreneurship, lack of access to investors and lack of support from the public and private sectors.<sup>22</sup> Other reasons are the rate of adoption of technologies which is attributed to several reasons among them: tedious registration of farmers, reluctance of farmers to pay for such products, the kind of business approach taken by the providers of ICT products, few platforms that offer integrated services, the low market willingness to take up such products and the minimal value chain addition that existing products have offered.<sup>23</sup>

It is, therefore, demonstrated that ICT for agriculture is an essential value-add to the sector's growth and socio-economic transformation of the country. As agriculture is a key area of focus under the Big Four Agenda, there is need to assess the role of ICT use in the sector. The implementation of the plan identifies ICT as a critical enabler of the development goals of the sector. Therefore, there is a convergence between CTA's work in the Vijabiz project and the government agenda of mainstreaming the use of ICT in agribusiness.



©Vijabiz project

20 G-Soko Structured Trading System- <http://eagc.org/services/g-soko/>

21 iCow website-<http://www.icow.co.ke/products>

22 Ministry of Agriculture, Livestock and Fisheries, Kenya Youth Agribusiness Strategy 2017-2021.

23 Embassy of United Kingdom of Netherlands- Report on ICT Opportunities in Agricultural Sector in Kenya 2019.

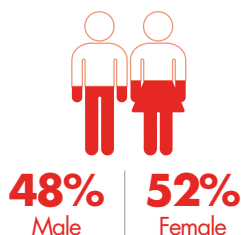


## 3.2 Vijabiz youth groups overview and survey sample characteristics

The Vijabiz project recruited 166 groups (later reduced to 163 groups) at the beginning of the project in 2018. The total direct beneficiaries mainly group members are 2,330 youth in Kilifi and Nakuru counties. The groups average membership is 14 members. The group with the highest number of members has 25 members while the one with the least has 10 members.



Percentage of members below 35 years of age, who are the majority



Membership



Groups recruited who are engaged in the cereals value chain



Groups engaged who are in the livestock value chain



Retained groups engaged with fisheries value chain activities.

Nakuru county registered a higher number of groups that participated in the survey, which proportionately reflects the higher number of groups supported in the county. With 75 respondents in this survey, 56 of the groups were from Nakuru while Kilifi County had 19 responses.

The table below presents the distribution of the sampled groups based on the county, gender of and age of the respondents, the activity value chain and their annual income in 2019.

**Table 2: Sample characteristics**

Sample Category	Sample Classification	No. of Groups
County	Nakuru	56
	Kilifi	19
Gender	Male	60
	Female	15
Age	15-29 years	34
	30+ years	41

Sample Category	Sample Classification	No. of Groups
Value chain	Fisheries	12
	Cereals	42
	Livestock	26
	Non-response	2
Annual Turnover (KES) <sup>24</sup>	< KES 150 000	32
	KES 150 000 to 250 000	34
	KES 250 001 to 500 000	5
	KES 500 001 - 1 million	2
	> KES 1 million	2

As illustrated by these statistics, youth representatives that responded included only 20% of women, while 52% of women are involved in the project. A hypothesis is that there are fewer women with ICT capacity involved in the project. Proactive action to improve rural women capacity in the use of digital tools may be needed to ensure inclusive rural transformation.

<sup>24</sup> The KES exchange rate to the US Dollar=108





## 3.3 ICT training and training needs

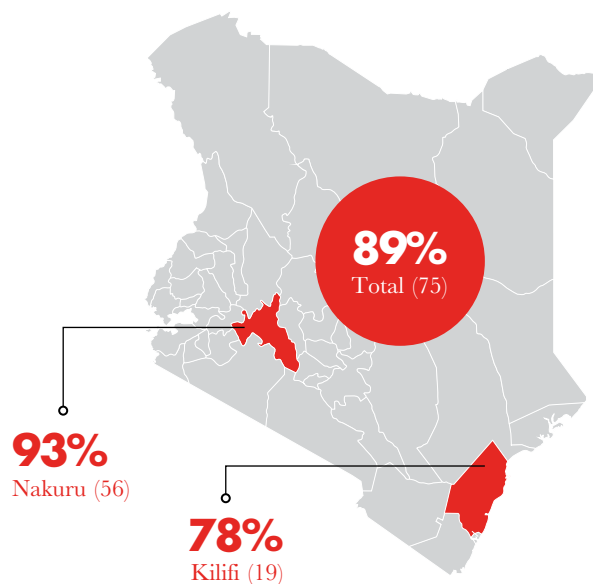
### 3.3.1 Vijabiz project ICT training delivered

Over the past two years of the project, Vijabiz organised and implemented various activities to support ICT adoption by youth involved in the project, among which a series of social media and ICT training. Nine in every 10 group representatives reported having taken part in the Vijabiz sponsored ICT training. Only eight (8) of the seventy-five group representatives who responded had not taken part in the Vijabiz ICT training session (other representatives of their group attended).



©Vijabiz project

Figure 5: Youth enterprises access to the Vijabiz sponsored training (% Yes)



The training content, leveraging on the CTA Web2.0 and social media training curriculum, customized, including the following items:

- Introduction to ICT for agriculture, social media concepts and principles
- Finding information on the Internet (online search, Google Alerts, etc.)
- Using Social Networking for Agribusiness (Facebook, Twitter, etc.)
- Collaboration using Online Conversation (Hangout, Skype, etc.)
- Use of Google Drive
- Record-Keeping using Spreadsheets
- Remote Collaboration Using Mailing Lists in Agribusiness
- Mobile Applications in Agriculture (with Kenyan examples).

This training content was additionally customized to groups of trainees' needs.



### 3.3.2 ICT training needs

The youth have been asked to specify what they, generally, consider as ICT needs for youth involved in agriculture. *The majority (71%) of the enterprises indicated that training on the use of spreadsheet software for bookkeeping purposes is the most important training need.* This was effectively one of the focuses of the training sessions organised by the project. Use of mobile applications and mobile phone to access and disseminate agricultural market information are some of the other needs the youths consider relevant and were respectively mentioned by 60% and 56% of the businesses. Regarding the use of social media and blog creation for agribusiness, half (53%) of the surveyed enterprises reported this to be a training need.

**Table 3: Youth ICT training needs**

ICT training needs	Percent of enterprises
Spreadsheet software for account management/book-keeping	71%
Use of Agriculture Mobile Applications	60%
Use of mobile phone to access or disseminate agricultural market information	56%
Use of social media such as Facebook, Twitter, Whatsapp, etc. for agribusiness	53%
Blog creation for the promotion of agricultural services	53%
Browsing and doing research on the internet	52%
Word processing software	36%

Capacity in the use of spreadsheet software for records keeping may thus be the first ICT need of many rural farmers in Kenya. The youth are reported to be very eager to learn and find training as a way of liberating themselves and therefore they will keep seeking opportunities to learn.

**“They are eager to learn, the access to smartphone stimulates record-keeping in a business. They will ask for certificates whenever they get trained, many can install apps and search for information Vijabiz ICT Training Provider”**

Institute of Advanced Technology (IAT) Nakuru.



On the other hand, training is considered a critical element in promoting ICT usage in rural agricultural value chains. Lack of ICT skills among the vast majority of the youth was said to hamper the intensive usage of ICT.

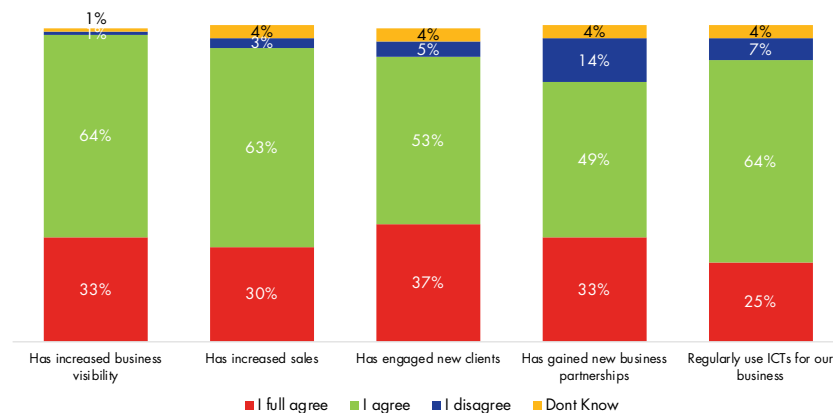
“Most of the groups Vijabiz worked with are rural-based. They have mobile phones, some have smartphones, but generally, some youth in rural areas do not connect the internet and use the ICT resources to their advantage. Therefore training that starts with basic IT literacy is required to help them appreciate ICT and how to apply it to promote business and social interactions, I would put IT literacy at 1 out of 10 for most rural youths”

Vijabiz ICT Training Provider - ICT4Development Kilifi County

### 3.3.3 Effects of the Vijabiz ICT training

The acquired knowledge and skills coupled with the use of ICT have increased business visibility, increased sales, and the number of clients as confirmed by at over 90% of the sampled businesses. The survey additionally found that the groups are using ICT regularly for agribusiness and new business partnerships are gained due to the training. The chart below highlights the distribution of the responses on a 3-point scale.

Figure 6: Effects of ICT training on youth business activities



Business practice changes influenced by the ICT activities include advertising on social media, communication to customers, and record keeping. It is noteworthy that training enhanced mostly groups customer reach and increased business sales. The table below also shows the number of youth businesses mentioning (open-ended question) that they were impacted in a specific way by the Vijabiz project ICT training.





**Table 4: Effects of Vijabiz project training on agribusiness**

Effect of Training	Number of Groups
Use social media in advertising	21
Reach more customers	16
Record keeping	14
Easily access information	10
Increased sales	7
Ease in marketing	6
Advertising (other forms apart from social media)	4

“We do research on types of fish that is needed by the market, we research on production practices, the maturity time needed and feeding requirement. We also are research on fish feeds ingredients and nutrition requirements for the different fish types and ages”.

Kibaokiche Vijabiz Youth Group Leader, Kilifi county

Digital marketing, access to information and record-keeping are the main business functions of enterprises that are positively impacted by the Vijabiz ICT training as the youth embrace digital marketing, online advertising and access information. Businesses representatives quoted use of ICT to communicate, liaise with value chain players-clients, suppliers, partners, and service providers. The youth appreciate ICT has eased and speeded up communication.

“Young farmers are able to monitor progress on the farm remotely. Marketing of produce is now telephone/application based. Tapping into export markets around East Africa region is dependent on ICT”

Software Developer KII



“There is a young farmer, who ended up selling some cabbages on Mkulima Young platform. The group has entered into a partnership with the county government to register and support farmers”

Step by Step Youth Group Leader, Nakuru County



51%

6 to 10 members own a smartphone

### 3.4 Youth enterprises access to & use of ICT

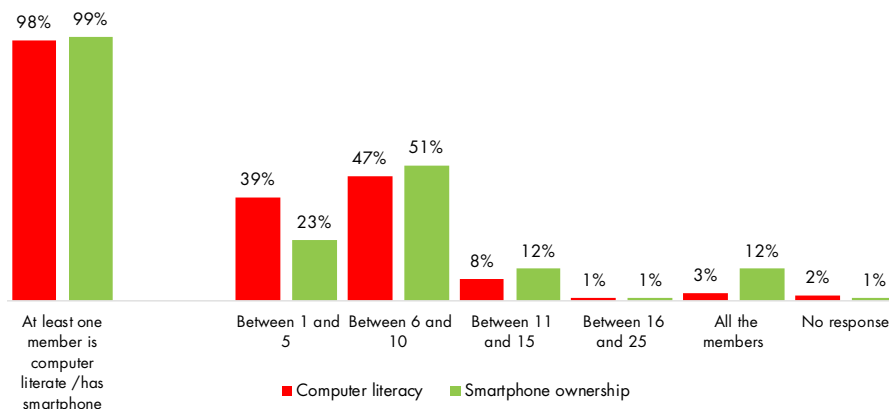
#### 3.4.1 Computer literacy and smartphone ownership within the Vijabiz youth

Computer literacy is defined for the survey simply as the capacity to use of a computer. Ninety-eight per cent (98%) of the Vijabiz groups indicated that there is at least one member who is computer literate and 99% of the groups showed that there is at least one member with a smartphone.

While half of the groups (51%) reported that they have between 6 to 10 members owning a smartphone, a lesser number of groups (forty-seven per cent -47%) have 6 to 10 members that are computer literate. This means that the youth groups have more capacity to use the smartphone than the computer, which may seem normal. To be noted, groups have between 10 and 25 members and most groups have around 10 members.

On another level, in eighty-eight per cent of the groups that were surveyed, there was at least one group member officially dedicated to ICT use for the group.

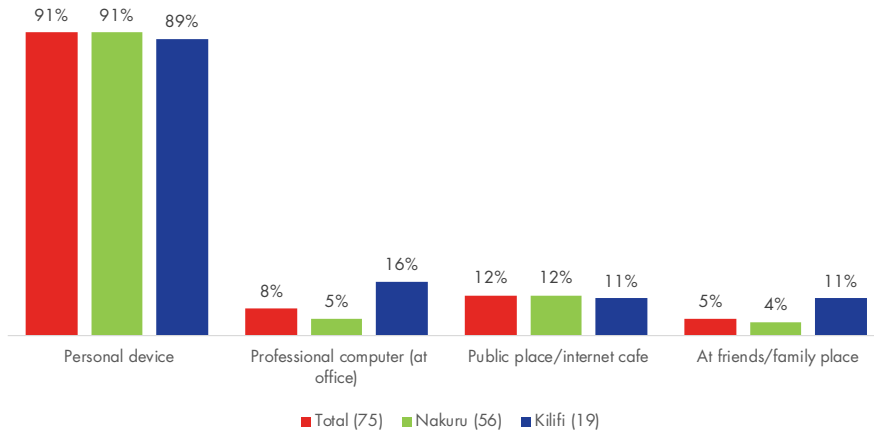
Figure 7: Computer literacy and ownership of smartphone in Vijabiz youth groups.



### 3.4.2 Internet access points for the youth

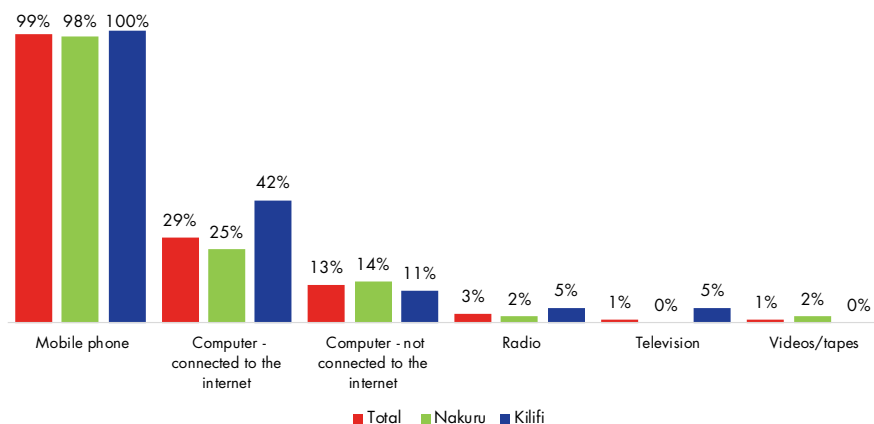
Almost all businesses are using mobile phones for business while 29% are using computers connected to the internet. Mobile devices are the key internet access points for the youth groups with just a few accessing the internet through an office computer. The figures are almost the same for Nakuru and Kilifi youth. The chart below presents access points of the internet for the Vijabiz project youth groups.

Figure 8: Internet access points used by the youth



This survey reconfirms the value of mobile devices as an essential ICT tool to nearly all youth businesses in the Vijabiz project. The handset is used for calls and to access the internet. There are a limited number of fixed telephone and the infrastructure is unreliable and limited to the central business districts of major towns in Kenya including Nakuru and Kilifi. The chart below shows the communication devices used by youth businesses.

Figure 9: Communication devices used for agricultural activities



The Vijabiz youth groups were asked what communication devices they use for their agricultural activities. While 99% of them use the mobile phone for these activities (the two counties considered), only 29% use a computer with internet connection and 13% a computer without internet connection for these activities. The number of groups that use videos or TV or even the radio specifically for agricultural activities are quite marginal.

The graph presents a differentiation of results per county.

The higher mention of the mobile phone is not surprising. This is a device the youth have more easily access to, almost permanently. Even the feature phones are recognized to be of use in the digital transformation. Bulk Short Messaging Services (SMS) are said to be relevant and in use by the actors in the sector.

“Since some youths have feature phones, USSD or SMS applications have really helped them to access agricultural related information. The mobile phone has brought more power than a computer which is less accessible; many mobile apps are accessible and cheap. Smartphones have brought transformation, phones are able to use solar power for charging, and one can walk to a neighbour to charge their phone.”

ICT Expert consulting for different rural agricultural projects in Kenya

“M-PESA allows us to make collections, make and receive payments, M-PESA makes payments easy and that helps keep track of costs”

Step by step Youth Group Leader KII

“Many of the traders have moved away from cash to M-PESA, mobile loans and payments are easier when the cash is on MPESA”

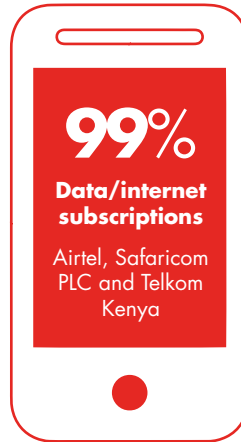
Software Developer KII

Ease of access, portability, low cost of acquisition of mobile handsets as compared to the cost of computers and convenience that comes with mobile devices are quoted as some of the key benefits that favour the mobile over the computer. Mobile internet is also more accessible than a fixed (wired) internet connection. As currently, mobile operators offer internet access, this makes it easy for youth enterprises to buy data and access the internet through their mobile handsets.



In line with this, the Communication Authority of Kenya industry quarter review for the period October to December 2019 shows the internet market in Kenya is dominated by mobile internet subscriptions.

The report indicated that the leading providers of voice and data services Airtel Networks, Safaricom PLC and Telkom Kenya account for 99 per cent of data/internet subscriptions.



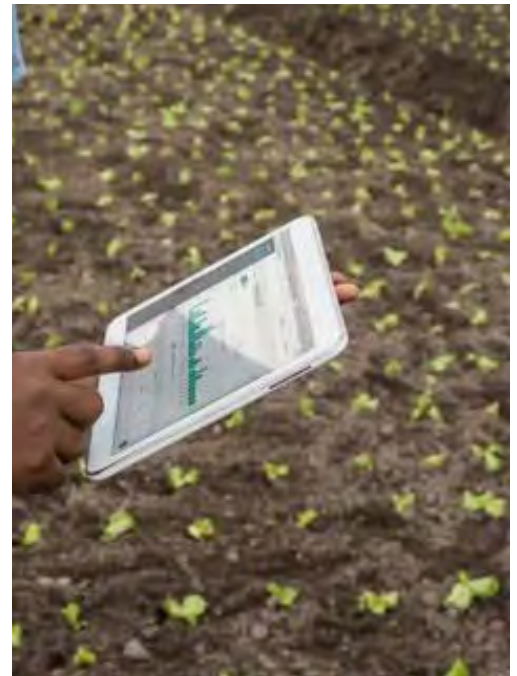
Total fixed (wired) Internet subscriptions are only 429,382 in a market with 39.6 million subscriptions. All this, therefore, explain why the Vijabiz project youth enterprises are using more the mobile phone for their agricultural activities than a computer (connected or not to the internet).

**TO NOTE:** Vijabiz youth enterprises are frequently connected to the internet with 80% indicating they connect to the internet either daily or several times a week.

### 3.4.3 Business motives for the usage of digital devices

The research evaluated for the business motives for the uses of the computer or mobile phones by youth enterprises. As illustrated by the graph below:

- The first four uses of the mobile phone are access to access/reception of market information (75%), sending or reception of payments (63%), buying or selling products (53%) and the promotion of business services (45%). Conversely, the first four motives for the use of computers are access/reception of market information (75%), records keeping (56%), buying of selling products (49%) and the promotion of business services.
- The youth hardly or weakly benefit from extension services or make use of farm management systems and applications through computers or mobile phones.
- These findings may suggest that the rural farmers in Kilifi and Nakuru weakly benefit from some advanced digital agriculture services (such as farm management digital services or even the reception of extension services). One explanation may be that some of these advanced uses require more consistently the use of smartphone and/or the use of mobile data which may be costly and less accessible to the rural youth.

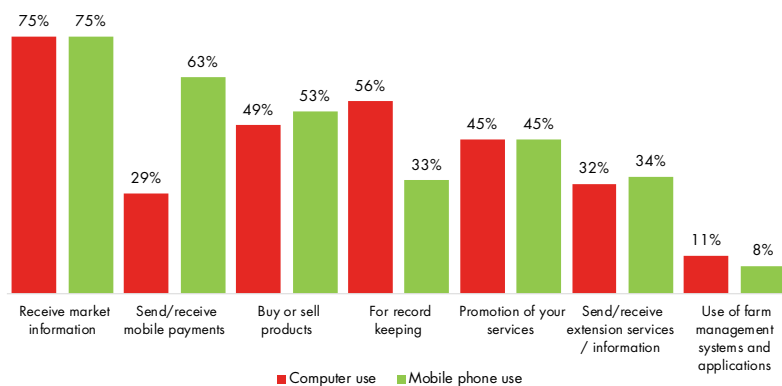


©CTA





Figure 10: Business motives for the usage of computers and mobile phones



The graph also suggests that the mobile phone is more used than the computer for the receipt or sending of payments (which can be understood considering the prevalence of the M-PESA) or for the receipt or sending or extension information/services.

The computer is more used than the mobile phone for records keeping or for the use of farm management systems and applications.

The computer and the mobile phone seem to be used at the same level for market information:

“We have been using ICT to communicate with people and do a bit of research on partners, on how we can get supplies, especially getting fingerlings (they are quite difficult to obtain at the right time) on prices and on the quality required”.

Wazo Jema - Vijabiz youth group Kilifi County

“Two Vijabiz groups engaged in fish production through the project have been consulting me on phone, we train them to where to source fingerlings, how to reduce mortality and also how to access quality fingerlings without being cheated by the sellers”

County Government Staff

“The youth are able to pick best practices elsewhere—from other farmers, exchange of information, make connection with input companies, reach extension service providers and link to market”

Vijabiz Training Provider-IAT Nakuru County



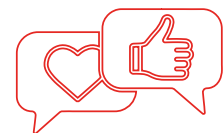
### 3.5 ICT use for agribusiness by the young farmers



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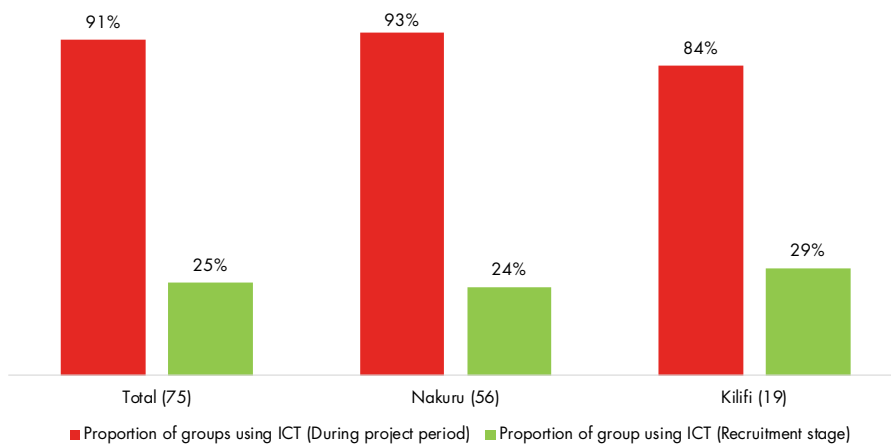
#### 3.5.1 Youth groups access to social media: some figures

Compared to the usage of social media at the time of entry into the Vijabiz project, there is a statistically significant difference in the proportion of enterprises that reported to have social media account. At the baseline stage, there were only 25% of businesses that said they had a social media account compared to 91% of enterprises during the time of the survey.



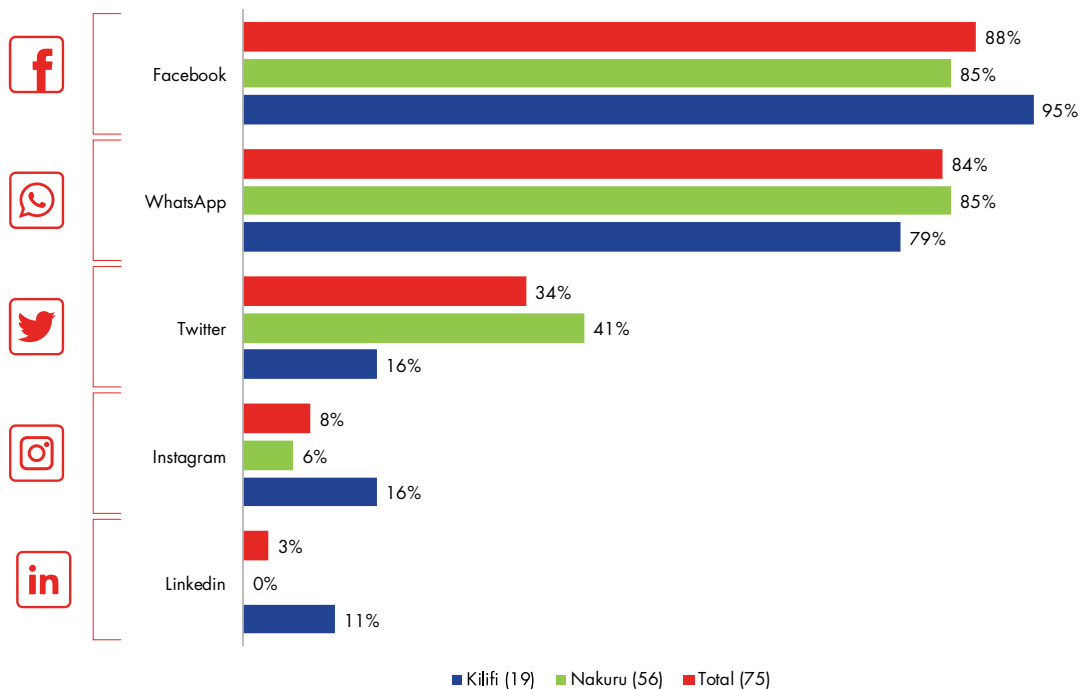
**25%**  
Businesses that have a social media account

Figure 11: Comparison of current use of social media by the youth and at the start of Vijabiz project



This survey has established that Facebook and WhatsApp are the most common social media applications that the Vijabiz groups are using for agribusiness activities.

Figure 12: Youth agripreneurs usage of social media



This growth in the number of businesses using social media is common across Kilifi and Nakuru counties and all the value chains. This is a growth that qualitative evidence from the KIIs attribute to the direct interventions by the Vijabiz project through ICT training and supporting the groups to set up and maintain social media accounts for agribusiness activities.

### Textbox 1: Social media spaces of the Vijabiz project

The VijaBiz project uses three main social media platform (Facebook, Twitter and Whatsapp) to share information and opportunities with direct and indirect beneficiaries, and to connect with potential partners. As of August 2020, the Facebook Page has 13,300 subscribers while and the Twitter account has 8,600 subscribers. Two project WhatsApp groups, each focused on one target county, connect youth groups involved. They are used for exchanges between the project team and the youth beneficiaries; the youth groups also use it to interact and share opportunities (call for grants, business opportunities, etc.) and achievements among themselves.



### 3.5.2 Examples of uses of social media for agribusiness

There are several active social media platforms including WhatsApp (from the project or other actors) which provide information, keeping the youths actively online and engaging with experts and extension officers; this helps them to get business information and to track market prices. The county agricultural and fisheries departments, as well as inputs and other service providers in Kilifi and Nakuru counties, have active WhatsApp forums where current information on agribusiness is shared. These contribute to the online activity of the youth on social media.

“Penetration of mobile phones especially smartphones have really gotten youth exposed, new ideas are emerging, and the youth are seizing them. They can take pictures of the produce and even if they do not have a smartphone, they are able to borrow a phone, take pictures and are able to share. They are exposed to WhatsApp.”

ICT Software Developer KII

WhatsApp with a combination with a camera phone has been lauded as a powerful digital device that is changing communication, information access and transmission and is likely to change the marketing of agricultural produce in a significant way. **More businesses in Nakuru mentioned that they are using Twitter compared to the agribusinesses in Kilifi county.**

“Social media-WhatsApp, and Facebook, have penetrated a lot, people will take pictures and share. Nice pictures are taken of a farm, the produce and sent to market actors. Instagram is coming up.”

County Government Staff

#### Textbox 2: Wazo Jema group’s use of WhatsApp

This is said to lately to transform businesses. With a smartphone, the group takes pictures of the product and send out to customers to communicate and promote group offerings. The picture provides proof of the state and quality of the product- ‘taking a photo or video of a chicken on weighing scale communicates to a customer the actual weight’ a customer then just waits for their product which is sent through a delivery ‘motor cycle’. A customer then calls back to confirm they have received, and they pay through mobile money service. A government livestock officer is a member of the Whatsapp group and offers advice on challenges regarding pests and diseases. Youth will take a photo and share on WhatsApp -the livestock officer will engage the youth and offer support services. The WhatsApp group also has a business mentor who offers mentorship to the group. Follows conversation and offers tips about how to resolve various business challenges. The mentor was seconded to the group from Vijabiz project and offers consistent support to Wazo Jema.



Facebook has been adopted by several groups that have been trained during the Vijabiz project. Some of the businesses have progressed and are harnessing technology through multiple uses. The text box below puts into perspective how one of the groups has benefited from the use of Facebook to do marketing of products and communicate to the customers and other stakeholders in the market.

**Textbox 3: Vijabiz youth groups' use of Facebook - Greenthumb CBO use of combination of ICT solutions to promote business**



Since Vijabiz project ICT training, GreenThumb CBO recognizes that the use of ICT has improved marketing of its products. The group opened a Facebook page, it also created a twitter account which it is using to reach out to new customers. The group also got Google Africa support, who trained members and helped to create a Google page. The group indicated that it has had people come or call and indicate they got the group's name from the Google page. Google Africa regularly provides the group with statistics of the number of visits the group's page attracts. The group considers that it has been exposed to customers through ICT. "We have had customers and partners we would not have had if we did not use ICT for marketing. We have improved our visibility"

The group has used Facebook for marketing activities, it also publicizes the activities of the group to community. ICT based communication is getting more youths interested in fish production. The group holds online conversations with the youth mainly centred around fish production and the messages exposes the youth to fishpond making, organises experiential visits to help other youths to get exposure. To get other youths to start fish farming the group uses Facebook and connect youths to suppliers of fingerlings which are not easily available. The Facebook page is also used to provide people with information to help them to start fish farming. Facebook is used to share experiences, promote social interactions and passing on information to other youths in Kenya.

Facebook was credited to be an effective tool to recruit new customers especially those in distant markets outside the area of operation of the targeted businesses. The textbox below demonstrates how a rural-based youth agribusiness is targeting urban markets in Kilifi town, and how it plans in future to reach Mombasa and Nairobi customers.



©Greenthumb CBO





**Textbox 4: Use of Facebook to recruit new customers in markets away from production sites - Wazo Jema Vijabiz youth group use of Facebook**

The group has about 7 to 8 members who own smartphones. There is a dedicated member responsible for running the Facebook page (@wazojemayg). The group uses Facebook for product promotion and marketing. Wazo Jema has managed to link to customers. For example, the group has managed to link up with a customer who has an online shop. Group has used social media -Facebook mainly to secure orders and are using it to spread positive word of mouth about the products. This has helped to increase sales and most important increase visibility of the group to customers outside Bamba area of Kilifi county. The group has planned future expansion to Kilifi town, Mombasa or even Nairobi and hopes to rely on Facebook and such ICT based channels to promote its business and products to customers. The group considers Facebook an effective channel to communicate and market her products and prefers it to alternative marketing channels as it is less expensive, is easy to use and has can reach wide range of customers fast compared to other media.

Some of the Vijabiz youth groups have demonstrated consistent and regular social media presence with some using social media to advertise their products and theme communication campaigns to day-to-day events that draw high customer interest. One such business with a branded value-added cereal product used Facebook to promote products using a major event in 2019-the Ineos marathon event featuring a Kenya athlete-Eliud Kipchoge.

Figure 13: Use of ICT to design and execute an online marketing campaign



Source: Henrok Group Facebook Page

©Ustadi Foundation



**Textbox 5: Involvement of the Youth in the Vjabiz Twitter Chat series organised by the project - Youth groups involvement in the VijaBiz Twitter Chat Series**

The VijaBiz project used Twitter specifically to organise online discussions on issues and opportunities of youth agribusiness, in order to engage direct beneficiaries and other youth that may be interested (indirect beneficiaries); this also offered the opportunity to interact with potential partners. Three topics have so far been discussed during these Twitter Chat series. The first was organised on the 18th December 2019, the second on 29th January 2020 and third on 24th June 2020, respectively on challenges and opportunities for youth Kenyan in the Cereals, Fisheries and Dairy value chains. For each discussion, a couple of VijaBiz youth groups were invited to contribute and share their challenges, achievements, and perspectives. Some partners of Vjabiz were also involved. This activity was a first for most of the VijaBiz youth groups and promoted their use of social media. Discussions were moderated by a team from USTADI and CTA and some archives can be viewed online at <https://bit.ly/2XUm5FX>



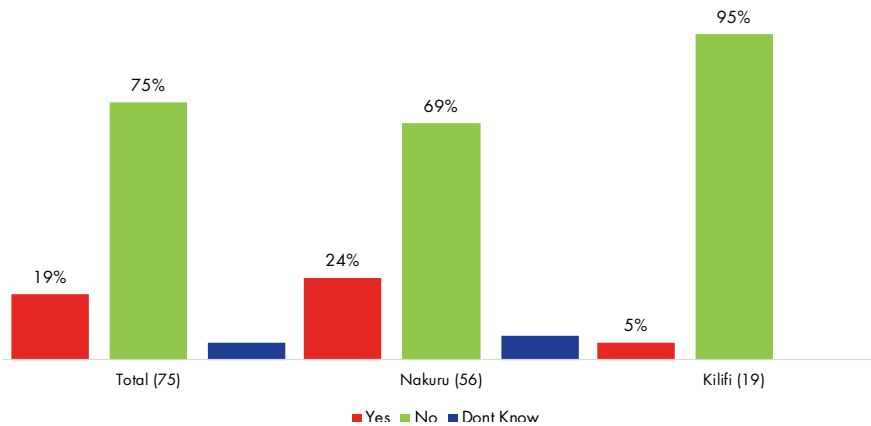
©Ustadi Foundation



### 3.5.3 Use of digital agricultural platforms

The survey sought to find out if the youth groups use digital agriculture platforms (mobile app or other e-agriculture facilities). The results show that a few groups (19%) use digital agriculture services provided by organisations in the country. Twenty-five per cent (25%) of the youth groups in Nakuru and 5% in Kilifi county use these services.

Figure 14: Use of digital agriculture services provided by organisations in Kenya



Examples of platforms used and cited by the youth include DigiCow, Mkulima Young, Zarisha, Yielder app, Yara Weather. A couple of platforms cited are not pure digital agriculture platforms but do provide advisory and other services using a variety of tools. This is the case of the *Nakuru Farmers Call Centre*, a county government-supported facility that provides information on Crops, Livestock, Fisheries via SMS, WhatsApp, Facebook interactions, Twitter, etc.

“By using Mkulima track harvest which is an online platform where buyers interact with farmers directly. Other than that, we use social media like WhatsApp and Facebook for outreach and dissemination of information”.

EKIDS Youth Group-Kilifi county

The Vijabiz project has collaborated with the Mkulima Young platform so that it supports market access for many youth groups by disseminating information on their offerings.

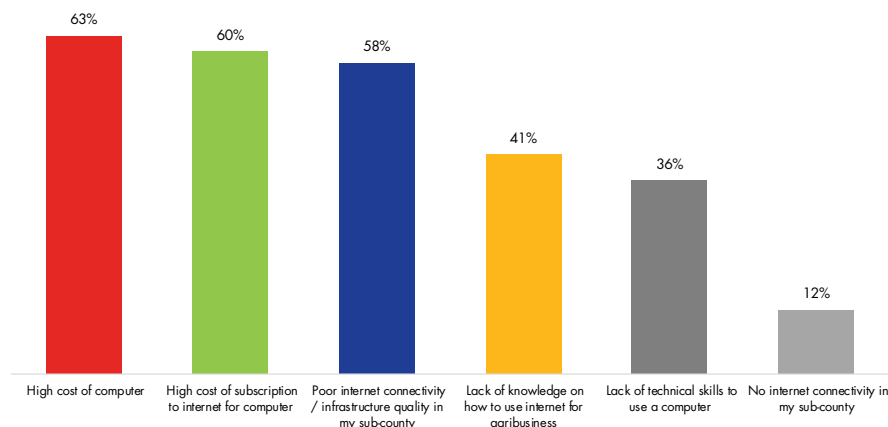


## 3.6 ICT usage gaps and barriers among youth agribusinesses

### 3.6.1 Challenges in using computers

Vijabiz project enterprises have experienced challenges when using computers. The challenges related to the high cost of computers (63%), high cost of internet subscription (60%), poor connectivity (58%) and knowledge and skills gaps (41%).

Figure 15: Challenges of computers use in agribusiness



“We are looking into acquiring a computer to help us improve our record-keeping, but the cost of one is high. We need to have our records in soft copy. Our record-keeping is manual, we are planning to have it computerized. We want to use Google drive. The hard copies are becoming bulky. This will allow us to access the documents from anywhere”

Step by Step Youth Group Leader, Nakuru county



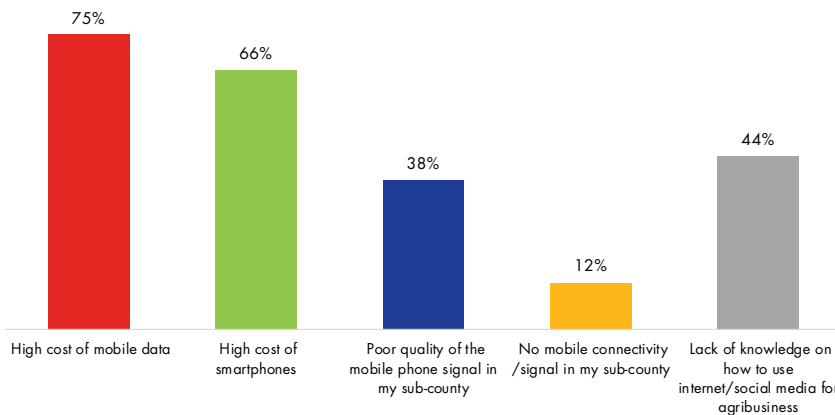
“We have not used any ICT for record-keeping. We have limited knowledge on how to keep our records, we are having challenges with members who are asking for records on how the business is performing and how expenditure has been done. We have started blame game and we may lose membership trust”

Tumaini Youth Group Leader, Kilifi county

### 3.6.2 Challenges in using mobile phones

The challenges experienced by the youth enterprises when using mobile devices to access ICT services are similar to those they face when using computer with only a higher number that mentioned that they face high cost of mobile data (75%). In the chart below presents the results of the challenges the youth face when accessing digital services through the mobile phone.

Figure 16: Challenges of mobile technology in agribusiness for the youth



75%

Face high cost of mobile data

#### Textbox 6: Rural-based youth ICT challenges - Kibaokiche fish farmers youth group

Despite the training received, the group indicated that there still gaps in usage of ICT technologies mainly attributable to IT literacy with only 55% of the members accessing internet. Though some members have personal smartphones, the group has only one computer connected to the internet through an internet modem. This uses Safaricom service that is expensive to maintain. The modem internet speeds are slow, costly, bundles are expensive and run out fast. Connection is poor, limited by costs and limits the time the group members can spend online. Kibaokiche youth group leaders consider that the members need more exposure on how to digitize the business processes, especially training on how to develop financial records, training on programs to support record keeping.





“We have had network [internet connectivity] issues, we are in an area that is deep interior with a poor network, internet bundles are expensive. We cannot afford to be online throughout or as regular as we would wish”.

Achievers Umoja Youth Group Leader, Nakuru county

These challenges are similar to what other studies in the recent past including what CTA’s earlier review of challenges of ICT use in Africa Caribbean and Pacific countries<sup>25</sup> have found. The paper documented challenges that included the high cost of infrastructure, poor connectivity, and lack of necessary skills to use the technologies. This reconfirms that the challenges faced by the group of youth agribusinesses in Kilifi and Nakuru are not unique to them and cut across farming communities from diverse backgrounds.

Qualitative results from key informants and youth group leaders interviewed in this study also found that limited user support to youth entrepreneurs in agriculture is affecting the usage of digital solutions. With most application developers based in major towns especially Nairobi, reaching rural farming groups is considered expensive, is not sustained and therefore exposure and knowledge building on ‘how to’ affects the adoption of ICT tools and solutions. Key informants are asking for a rethink of the business model adopted by technology proponents to deepen the usage of ICT solutions. The informants recommended collaboration and partnerships with rural-based entities such as ICT savvy groups that could accelerate the rate of adoption of agribusiness ICT solutions in rural areas and cut the cost of transfer of technologies to rural youths. This was said would address barriers of the cost that comes with travel and upkeep of distant support teams and enhance consistent support to rural youth and other ICT users with no or limited formal education.

“We need training on how to use ICT. We need to move from just using the social media for social reasons to do business using ICT. We are getting opportunities to sell some products on social media. We recently got a tender to do beatification and landscaping of a government compound. We got the information from a WhatsApp forum”.

Maiella Youth Group Leader, Nakuru county

25 <https://ictupdate.cta.int/en/article/challenges-and-opportunities-for-ict-adoption-in-agricultural-extension-sid03b7c751a-f2db-48c7-a5ed-40344e00e00a#:~:text=However%2C%20challenges%20exist%20to%20using,skills%20to%20use%20the%20technologies.>



“The IT mentor has not been coming, we have limited support to help us with IT skills to enable us use ICT effectively. We require hand holding, we have limited skilled people within our membership. The level of education of most our members is low, we need a lot of support to get us to use ICT for business.

*Tumaini Youth Group Leader, Kilifi county*

The scale and scope of the products market was also found to influence the use of ICT solutions. Enterprises with unbranded products and selling within a limited local area have reported limited use of social media.

“We have no branded product, we just sell within this area, we get tenders from flower farms around Naivasha to supply maize flour for the staff. We do not have large farms and sometimes demand stretches our locally produced maize and we buy maize from other farmers. We have no machine that can produce grade 1 flour and package, so we are limited to local buyers within our area. This therefore does not require us to use ICT based marketing channels”.

*Maiella United Youth Group Leader, Nakuru county.*

## ICT USE CHALLENGES FACED BY YOUNG WOMEN

Achievers Umoja Youth Groups is constituted with a majority of women members. While the issues faced by rural youth may be general to both gender in many cases, the results of this survey showed that women issues may be more preoccupying. The women faced more challenges to acquire smartphones and other digital devices. This may be attributed to the low scale of businesses of many of them. The young rural women also cited, apparently more than men, technical capacity challenges.

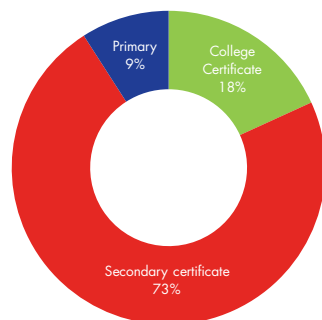
“Smartphones are expensive and due to our limited income, we cannot afford to buy them. We are also challenged by limited knowledge of how to use IT”.

*Achievers Umoja Youth Group Leader, Nakuru county*



Data collected on the groups' membership also show that few have attained formal education beyond secondary, which may limit their exposure to formal technology training.

Figure 17: Formal education training for Achievers women group members



Many women involved in the project face mobility challenges that limit their access to ICT infrastructure that lacks in rural areas.

### Textbox 7: Poor ICT infrastructure and IT support gaps affecting the youth in rural areas



Lare Milk Dealers Youth Group cited several challenges that inhibit use of ICT in agribusiness. These include the poor internet connectivity as the group is in a deep rural area that is poor served by the existing telecommunication providers. “We are 15 kilometres from Njoro town and network is a problem, we sometimes have to wait for connectivity for hours and this sometimes causes customer complaints”.

The group considers the cost of connecting to internet through wireless connection to be high. Downloading and uploading internet speeds were said to be slow and this discourages the users. Majority of the group members are not computer literate and some cannot read and write. Therefore, the group lacks technical support to help the few who own personal smartphones. The group has no access to computers and the records are mainly manual in books.

“Most members do not how to use a computer or smartphones, we have members with low literacy background, and this affects their ability to use ICT”. We however work with a university student from the area who can progress the group activities for all. The assistances however must go back to school from time to time. during such times, we do not use ICT solutions in our business. The public access points through a cyber is distance away and members of the group would have to commute to reach the cyber that is located approximately 15 kilometres away.



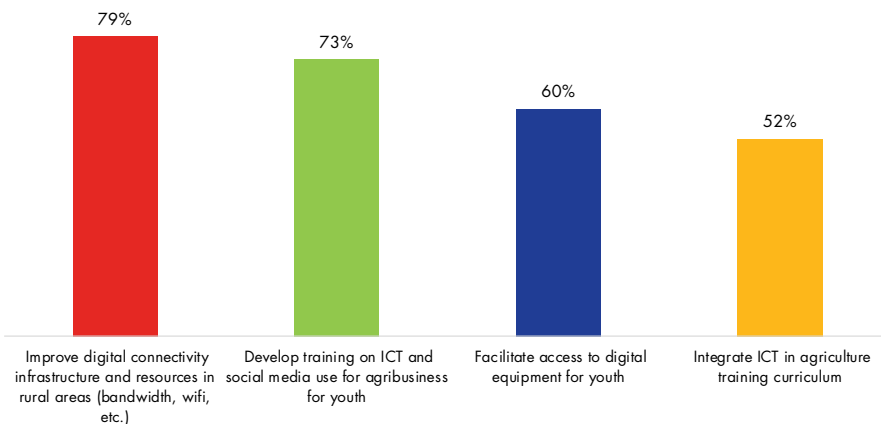
## 3.7 ICT support ecosystem

Different actors are performing different roles in supporting the adoption of ICT in agribusiness in Kenya. Among them is the government, ICT service providers, value chain intermediaries, non-governmental organisation funding projects in rural areas among others. This section describes the support rendered by each of the actors.

### 3.7.1 Role of government in enhancing ICT services

The youth in agribusiness consider the government key driver of ICT use in agriculture. Among other things, the enterprises expect the government to develop and expand infrastructure to enhance connectivity (79%), develop ICT training programs and facilitate the access of digital equipment for the users (60%). The expectations are in line with the challenges that youth stated are hampering the ICT usage in Kenya. The chart below captures the results of the youth farmers' expectations of what the government should facilitate.

Figure 18: Government expected roles in promoting ICT access and usage (youth points of view)



### 3.7.2 County Government supported ICT initiatives

Key informants reported that Nakuru county government has established a call centre that promotes the use of ICT and specifically access to computers and the internet for the youth. Egerton University in Nakuru county and Pwani University were also said to be supporting digital agenda and promoting the use of ICT among youth entrepreneurs in agriculture and fishing.

County government departments are reported to have several ICT-based online platforms mostly on WhatsApp where the youth in agribusiness access information, advisory services, network with other groups and get news, especially on diseases and pests. Similar forums exist and include input suppliers and service providers. The platform additionally provides market price information and link farmer groups to markets or buyers. The government staff are reported to be encouraging farmers to use technology to access information and to support the gap created by a limited number of extension staff in the counties.



**79%**

Enterprises that expect the government to develop and expand infrastructure to enhance connectivity



**Textbox 8: County government use of ICT to support rural agribusinesses**

County government leveraging ICT: The county government in Nakuru was reported to be collaborating with Safaricom's Digifarm which is promoting farmers to access information and markets. The platform provides information on weather, rainfall, produce markets, and market prices. The county has also been open to include other organisations that have ICT applications that provide weather information and can customize the apps to suit needs of the county residents. The county has a farmers' call centre which has an SMS platform. The call centre has a database of farmers and information is provided on call or through SMS. In addition, the county staff have initiated several WhatsApp platforms including some for actors in the potato value chains, avocado, fisheries, avocado, cereals and one micronutrient rich beans. These are used to promote production through access to technical support, production practices, and marketing of the produce. There are also WhatsApp groups that are responding to farmers and stakeholders' interests and concerns related to locusts and food safety. The WhatsApp groups have county government extension officers who offer technical answers to questions asked by farmers and value chain actors. Farmers consistently post pictures of pests and diseases and this helps the county extension staff to be aware and to assist farmers in pests and diseases control.

The county staff have a WhatsApp forum which includes senior ministry staff and County Executive Committee Member (CEC). This forum is used to keep officers and leadership in issues emerging from farmers and discuss response strategy. This helped in recent times when there was an outbreak of the fall army attacked which affected the county and farmers alerted the staff through WhatsApp. The messages from farmers were escalated to the county technical team through WhatsApp.

“There are many farmer groups on WhatsApp, you can be in specific groups and people consult and get information, there is selling and buying of farm produce that is enabled through these WhatsApp forums”

County Government Staff KII

“There is a platform created recently-Mkulima Young. The County Executive Committee Member for Agriculture (CEC) is advocating for use of this platform. The CEC is urging players to register on the platform.”

County Government Staff KII





“We are using the WhatsApp forums to monitor pests and diseases outbreak. We have a network of disease and pests scouts among farmers. These will post alerts and as technical teams we discuss and provide rapid response.”

County Government Staff KII

### 3.7.3 ICT solutions providers

The private sector in the ICT sectors are at the forefront in the development and roll out digital tools that are addressing various challenges faced by the youth enterprises in the value chains. From developers, trainers, ICT infrastructure providers and other actors such as Google Africa are leading innovations and implementation of initiatives that deepen the use of digital solutions. The digital solutions improve transparency, reduce complaints and increase credit rating, therefore, enabling the access to finance and credit for smallholder farmers and groups.

“Cooperatives have digital scales, and digital solutions that enable farmer registration, automated and SMS systems and integration of farmers payment and bank reconciliation. The data helps farmers to access credit since the cooperatives have income data from the milk or other produce delivered to the cooperatives”

County Government Staff KII

### 3.7.4 Value chain intermediaries

The production and marketing value chain actors are also credited in driving the adoption and use of technology in the agricultural value chains. Market produce buyers such as dairy cooperatives, Kenya Tea Development Agency, horticultural produce exporters, and farm produce marketers such as Twiga Foods are reported to aid in the growth of technology usage in agribusiness.

“Twiga Foods have allowed easy access to market. They have used ICT to source farm produce and link to retailers.”

County Government Staff KII



“A lot of fresh produce marketing apps are coming -there is a lot of deliveries, food deliveries are big and not necessarily to the eateries but also to the sheds, ‘mama mbogas.”

Vijabiz ICT Training Provider - ICT4Development Kilifi County

### 3.7.5 Non-State Actors

Donor sponsored initiatives are promoting good practices and addressing agricultural value chains. Such one example is the International Fund for Agricultural Development (IFAD) program where the Eastern Africa Grain Council (EAGC) has digitized aggregation centres under the Kenya Cereals Enhancement Program (KCEP). This is reported to have increased trust and offered better prices to the smallholder farmers in cereal growing areas. EAGC has encouraged the use of digital scales, large trampoline to dry cereals, use of the moisture meter, to ensure the grain meets the required quality standard.

“In Molo and Njoro some Vijabiz groups who are members of the EAGC digitized aggregation centres are benefiting from this technology.”

County Government Staff KII



## 4. CONCLUSIONS AND RECOMMENDATIONS



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The youth in Kenya have experienced transformational growth in the ICT infrastructure and there is increased access, awareness and usage of ICT especially the mobile phone, mobile internet, and mobile applications such as social media. Increased awareness, knowledge, and skills of how to turn ICT into enterprise opportunities has been credited to the emergence of interest and youth participation in agribusiness activities involving value addition or product marketing.

As agriculture turns into intensive farming and value addition, the supported and trained Vijabiz project youth enterprises who may have previously been excluded in the production and marketing of agricultural produce to have an upper hand as they have embraced technology. It is recommended that capacity building to scale the enterprises be supported in future activities. Scaling the enterprises to achieve commercial viability levels will help the youth realise the full benefits of ICT use.

The ICT solution providers have developed tools that have shown the potential transformation of agriculture and agribusiness. The youths are adopting digital tools and solutions that improve access to information, the interaction between actors, linkage to input and produce markets, improved access to finance, products value addition and marketing.



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Cost of ICT hardware and internet services and poor connectivity are the main challenges in the growth of e-commerce among the youth agribusinesses. The role of government and ICT service providers in rolling out infrastructure, providing policy to grow the ICT sector and institute taxation measures that lower the cost of hardware and services is paramount. The Kenya government Digital Economy Blueprint is one such measure and should be timely implemented for the benefit of enterprises including the agriculture linked businesses such as the ones supported by this project.

County governments staff in Kilifi and Nakuru have embraced simple ICT applications and solutions including WhatsApp that are widely used in information dissemination and as marketing platforms. Facebook has taken root in Nakuru county and specifically, Mkulima Young interactive page is driving up marketing and information access among the youth. ICT-based platforms have therefore been used to bridge the gap in staff capacity in the counties affected by staff shortage. There are however still gaps in government staff capacity to maximise the use of ICT solutions to promote production, information dissemination, promotion of agribusiness, value addition and marketing of agricultural products.

The trained youth, therefore, should play a leading role not only to support own group members but use ICT to cascade the knowledge and experiences to other youths in the counties and other youths in and out of Kenya.

There is limited institutional support to promote youth and farmers to access and adopt ICT. Lessons can be picked from the Vijaiz project and the interventions scaled to reach more counties and more youth groups to help promote production, value addition, marketing, and networking within the agricultural sector. The experience of the Vijabiz project shows that ICT has a critical role to bridge the gap in extension services and access to information among players in the agricultural value chain. County governments and other actors should consider promoting the adoption of ICT to improve extension support and overall agricultural sector and enhance the growth of agribusinesses.

Specific to young women in rural areas, this study helps to draw hypotheses that they are facing more challenges to adopt and use ICTs. Proactive action to improve rural women capacity in the use of digital tools may be needed to ensure inclusive rural transformation.



## 5. ANNEX

### List of survey respondents

Name of Group	Name of Group	Name of Group
Achievers Umoja Youth Group	Kakoeni Youth Group	Rongai FC Youth Group
Amani Kabianga Youth	Kampi Ya Moto Development Youth Group	Rongai Vision Bodaboda Millers
Amazing Grace Self Help Group	Kanyati Arising Youth Group	Rotugaa
Amka Youth Group	Kapsegut Self Help Youth Group	Salgaa Baraka Star Youth Group
Aoon Jubilee Youth Group	Kapyemit Tumaini Youth Group	Set Kobor
Bahatika Youth Group	Kibaokiche Fish Farmers Youth Group	Shibe Delta And General Enterprises Limited
Bee My Partner Youth Group	Kibaraa Youths Self Help Group	Smart Dedicated Youth Group
Blessings Hand Self Help Group	Kilifi Mwelekeo Fisheries Group	Speak
Chai Moto Farmers	Kingston Pioneer	Step By Step Youth Group
Chania Youth Group	Kolongei Self Help Group	Takaungu Boda Boda Youth Group
Chepkiswet Dynamic Youth Group	Kumi Bora Self Help Group	Tarima Dairy Youth Group
Chira Nuru CBO	Kuza Kilimo Shg	Techgaa Youth Group
Creative Investors	Lare Milk Dealers Youth Group	Ten Sisters Shg
Eaglesight Youth Group	Mabadiliko CHW	Tenden Youths Group
Ekids - Kilifi	Maiella United Youth Group	The Rainbow Youth Group
E-Maziwa Innovations	Maziani Youth Bunge	Thirandu Village Youth Group
Empiros Enkai Youth Group	Mchekenzi Binge Youth Group	Tiger Group
Enda Mbele Self Help Group	Milimet Taunet Youth Group	Tosha Youth Group
Galana River Self Help Group	Mwangaza Naishi Game Youth Group	Tujjivunie Mazingira Yetu Youth Group
Gilani Umoja Self Help Group	Nax 7 Men Self Help Group	Tumaini Youth Group
Gituamba Young Men And Women Group	Nderit Environmental Women Group	Umoja Youth Group
Greenbelt Youth Group	Njoro Fish Farmers Cooperative Society Ltd	Ushindi Youth Group-Kihingo
Greenthumb CBO	Rabai Business Incubation Center	Uwezo Youth Group
Henrok 6 Group	Redroses Youth Group	Vision Nguiriga Self Help Group
Inuka Njoro Youth Group	Regional Youth Resource & Information Center	Wazo Jema Youth Group
Kabatini Ni Kwetu Youth Group	Rombe Youth Group	Youth Awake Bunge





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