Food and Agriculture Organization
of the United Nations



KNOWLEDGE MATERIALS – VALUE CHAINS

RURAL EMPLOYMENT

Youth centered value chain analysis

The cases of Siaya and Kakamega counties in Kenya

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Abbreviations and acronyms

ADS	Anglican Development Services
AFC	Agricultural Finance Corporation
AI	artificial insemination
AGPO	access to government procurement opportunities
ASDSP	Agricultural Sector Development Support Programme
ATM	automatic vending machine
BDS	business development services
BMU	Beach Management Unit
CBO	community-based organization
CIDP	County Integrated Development Programme
CSA	climate-smart agriculture
CWES	Constituency Women Enterprise Scheme
EGF	Equity Group Foundation
FAO	Food and Agriculture Organization of the United Nations
FGD	focus group discussion
GDP	gross domestic product
GIZ	German International Development Organization
HIV	human immune deficiency virus
ICA	Integrated Country Approach
IC	indigenous chicken
ICT	information and communications technology
ILO	International Labour Organization
JOUUST	Jaramogi Oginga Odinga University of Science and Technology
KALRO	Kenya Agriculture and Livestock Research Organization
KCSAP	Kenya Climate Smart Agriculture Programme
KCYAA	Kakamega County Youth Agribusiness Association
KDB	Kenya Dairy Board
KEEP	Kakamega Environmental Education Programme
KEFRI	Kenya Forestry Research Institute
KEPHIS	Kenya Plant Health Inspectorate Service
KIE	Kenya Industrial Estates
KII	Key Informant Interview
KNBS	Kenya National Bureau of Statistics

KRB	Kenya Roads Board
KVB	Kenya Veterinary Board
KWFT	Kenya Women Finance Trust
LM	lower medium
LPG	liquefied petroleum gas
MFIs	microfinance institutions
MOALFC	Ministry of Agriculture Livestock Fisheries and Cooperatives
MUFATE	Mudete Factory Tea Growers
NHIF	National Hospital Insurance Fund
NSSF	National Social Security Fund
OSH	occupational safety and health
PPBK	Pharmacy and Poisons Board of Kenya
PPEs	personal protective equipment
RICS	Roads Inventory and Conditions Survey
SCAO	Sub-county agriculture officer
SFR	strategic food reserve
SFVC	sustainable food Value chain development
SHG	self-help group
SIDA	Swedish International Development Cooperation Agency
SIST	Siaya Institute of Science and Technology
SMEs	small and micro enterprises
SOFDI	Sustainable Organic Farming Development Initiative
SPSS	Statistical Package for Social Sciences
SSA	sub-Saharan Africa
SWOT	strengths, weaknesses, opportunities and threats
TSC	Teachers Service Commission
USAID	United States Agency for International Development
UM	upper medium
VC	value chain
WEAEP	Western Education Advocacy and Empowerment Programme
WEF	Women Enterprise Fund
YABIC	Youth Agribusiness Incubation Centre
YAW	Young Africa Works
YEDF	Youth Enterprise Development Find

Executive summary

The FAO project Integrated Country Approach (ICA) for boosting decent jobs for youth in the agrifood system "ICA project" seeks to support countries in adopting and implementing more youth-inclusive agrifood system development policies, strategies and programmes. Its ultimate objective is to reduce rural poverty and distress migration among rural young women and men by creating decent employment opportunities (wage/self-employment) for youth in the agrifood sector. The ICA project is implemented in five countries in sub-Saharan Africa and Latin America, funded by the Swedish International Development Cooperation Agency (Sida). In Kenya, the ICA project plans to adopt youth-centeredvalue chain development approaches in two counties (Kakamega and Siaya) to accompany the implementation of the 2017 Kenya Youth in Agribusiness strategy. It is against this background that the youth-centeredvalue chain analysis study of multiple value chains in Kakamega and Siaya Counties was carried out.

The youth-centeredand gender-sensitive value chain analysis had the objective to assess the current engagement of youth in the specific value chains, as well as the specific challenges that youth face and the opportunities that could be tapped into for the generation of more and better jobs. The study sought to identify key issues, bottlenecks and leverage points in the selected value chains and propose a vision which would form the basis for an upgrading strategy with practical/actionable points which consider the triple bottom line of sustainability (economic, social and environmental) and improve opportunities for decent rural youth employment in the selected value chains, whether in self or wage employment. Special emphasis would be placed on youth access to finance.

This study used a snowball research design and purposive sampling technique. This entailed targeting a small sample of key informants in the two counties - Kakamega and Siaya - who were interviewed to provide information to validate key potential value chains where youth involvement had the highest potential. This technique started with the identification of one group of youth farmers who in turn referred the researchers to the other groups with similar characteristics and so on. Due to the research design and the sampling technique, results presented in this study, especially descriptive statistics of interviewed respondents, are not representative of the respective counties. Thereafter, a detailed value chain analysis was carried out for all the selected value chains (VC) (Dairy, fish, poultry and soya in Kakamega and avocado, fish, poultry and mango in Siaya) using quantitative and qualitative research methods. Quantitative methods applied were frequencies and percentages which were presented in the frequency distribution tables, pie charts and bar graphs. These methods were used to generate numerical data based on the use of mainly closed-ended questions to target respondents, while qualitative methods were applied to explore and understand people's beliefs, experiences, attitudes, behavior and interactions and to generate non-numerical data. These were based on the use of open-ended questions to target respondents during focus group discussions (FGDs) and Key Informant Interviews (KIIs). The study achieved a total of 525 interviews with value chain actors in the two counties against a target of 400 (131.25 percentage achievement), a total of 19 focus group discussions against a target of 24 (79.16 percentage achievement) and a total of 68 key informants interviews against a target of 75 (90.67 percentage achievement). In addition, two stakeholders' workshops were held in Kakamega and Siaya to review and validate the study findings.

The study findings revealed that there are a number of opportunities in the targeted value chains in the two counties. These opportunities were prioritized by the stakeholders during the validation workshops.

In Kakamega County, opportunities for youth employment exist in the poultry value chain including chicken brooding, feeds formulation, formation of cooperatives to enhance marketing of poultry and provision of poultry vaccinations. In the dairy value chain, opportunities exist for youth engagement in fodder production and conservation. There are good examples of youth who have excelled in this area especially in Lugari, Ikolomani and Likuyani sub-county. For example, in Lugari, Matende Farm was run and managed by youth, while in Ikolomani, Crescendo Youth Group specialized in fodder production. It was noted

that gross margin for production of feeds, which could be done on leased land provided gross margins in the range of K Sh 30 000 to 75 000 per annum. Youth could also be trained to provide extension services such as provision of artificial insemination (AI) to farmers in the dairy value chain. It was found that these services were in demand and the existing extension services provided by the county government were not adequate due to lack of staff and resources. Youth trained on AI could act as agents for distribution of this service or as community-based extension staff to administer AI. On average cost of an AI jab was estimated at K Sh 1 000 with net returns after costs of K Sh 400 per jab. On the other hand, revenues from sale of AI doses and nitrogen were estimated at K Sh 12 000 for 35 doses of local semen and net of costs, returns would be K Sh 4 000.

In the soya value chain, opportunities exist for youth in soya value addition such as production of soya milk which is quite popular in the market and also in roasting of soya beans. For example, from production of soya milk, youth could generate about K Sh 19 000 per month and this type of business did not require a lot of capital. Youth could also market the value-added products using online platforms In the fish value chain, opportunities existed in establishment of fish ponds. Youth could lease land for establishment of fish ponds. To establish a fish pond of 300 m^2 would cost approximately K Sh 60 000 and the returns of fish pond farming for eight months were about K Sh 129 500. Youth could also be engaged in fish value addition such as making fish samosas, fish fillet and fish fingers and cooking fried fish. These businesses had the capacity to generate an average of K Sh 150–450 per day for youth. Youth could also leverage on online marketing platforms for marketing of these value-added products.

In Siaya county, opportunities for youth employment exist in the avocado and mango value chains, where it was noted that youth could be trained to be seedling producers and to supply grafted mango tree seedlings of the apple, ngowe and kent variety and for Hass variety of avocados. On average one tree seedling sold for K Sh 200. Youth could also be engaged in providing services to avocado and mango farmers such as spraying services, application of pesticides, fungicides and herbicides. These services are charged per tree. For example, spraying and pruning of one tree would cost K Sh 200 per tree, with a population of 150 trees in one-acre youth could earn K Sh 30 000 per acre. In the soya value chain, opportunities were identified in soya value addition. In the fish value chain, opportunities exist in establishment of fish cage farming enterprise. This activity was considered most viable for youth in the production node of the fish value chain. Through financial linkages, youth can be supported to establish fish cage farming by supporting them to acquire the equipment and materials used in this farming business. For example, it was established that the construction cost for a fish cage with capacity for holding 2 000 fish was about K Sh 120 000. The gross margins for this type of business are about K Sh 180 000 for eight months. This business therefore had the capacity to employ youth especially in groups.

Finally, this study made a number of recommendations. One key recommendation that cut across all the value chains was the need for enhanced financial linkages to enable youth acquire capital to start a business, acquire equipment and raw materials. In addition, training and capacity building of youth to identify and take advantage of opportunities remains a complementary strong need, both for them to initiate a business and to work as wage workers or service providers. Across value chains and counties, the need to monitor working conditions, wages and informality with a gender lens is also a priority in order to guarantee productive and decent work opportunities for the youth in the sector.

1. Introduction

1.1 Background

Kenya became a low-middle-income country in 2014 and is East Africa's strongest economy. Nevertheless, it simultaneously holds the highest number of unemployed youths in the region. The Kenya National Bureau of Statistics (KNBS) estimates unemployment amongst youth aged 20–24 years at 19.2 percent (KNBS, 2018).

Addressing the youth employment challenge is particularly urgent given that 70 percent of Kenya's population is below 30 years and the median age is 19. Furthermore, the country is growing rapidly, at 2.5 percent annually, and is forecasted to reach a population of 66 million by 2030 and 91.5 million by 2050 (UNDESA, 2019).

In particular, more should be done to harness the potential of the agrifood sector in the country to contribute to the creation of decent jobs for young people. Agriculture contributes to 25 percent of gross domestic product (GDP), 65 percent of exports and employs approximately 60 percent of the total labour force employed. (World Bank, 2019) Yet, according to Kenya Youth Agribusiness Strategy (2017–2021), only 10 percent of youth are directly participating in the sector. Even though this percentage seems excessively low compared to neighbouring countries, there is a general trend of youth moving away from agriculture and rural areas as a whole.

Agriculture is not viewed by the youth as a viable business due to the fact that the majority of farmers practicing traditional farming methods, with poorly remunerated enterprises that do not lead to decent livelihoods. In spite of government recent efforts to transform smallholder agriculture to make it more market-oriented, the sector's growth and job creation potential is still hindered by numerous challenges. These include: underdeveloped value chains and low value addition, especially inefficiencies in the commodities supply chains due to limited post-harvest handling infrastructures, limited access to agricultural financing (with only 4 percent of commercial bank lending to agribusiness), weather related shocks, limited extension services (e.g. on adoption of modern technology), and limited irrigation usage (World Bank. 2016b).

The Kenya Youth Agribusiness Strategy 2017–2021, under the overall coordination of the Ministry of Agriculture Livestock, Fisheries and Cooperatives, identifies eleven strategic objectives to address the challenges that hamper meaning and sustainable youth participation in agribusiness, namely: transform youth perception towards agribusiness:

i) development of agribusiness skills, knowledge and information;

ii) improved access to affordable and youth friendly financial services for agripreneurship;

iii) enhance access and sustainable use of land;

iv) youth engagement in research and development of innovative agricultural technologies;

v) enhance access to inputs, modern technologies and utilization of good agricultural practices (gap) to increase efficiency;

vi) increase utilization of agricultural products through value addition;

vii) improved access to affordable suitable output markets for the youth;

viii) support implementation, reviews and development of policies that create an enabling environment for youth in agripreneurship;

ix) promote youth-inclusive climate smart agricultural technologies and create green jobs for environmental sustainability; and

x) promote an integrated approach to address cross-cutting challenges including gender disparities, cultural barriers, alcohol and substance abuse, HIV & Aids, weak governance and value systems amongst others.

Furthermore, the Kenya Climate Smart Agriculture Strategy (2017–2026) targets the enhancement of the capacity of Women, Youth and Vulnerable Groups to participate in Climate Smart Agriculture (CSA) activities. It is against this background that the value chain analysis study of multiple value chains in Kakamega and Siaya Counties was carried out.

1.2 Integrated Country Approach (ICA) Project

The FAO project Integrated Country Approach (ICA) for boosting decent jobs for youth in the agrifood system "ICA project" seeks to support countries in adopting and implementing more youth-inclusive agrifood system development policies, strategies and programmes. Its ultimate objective is to reduce rural poverty and provide alternative livelihoods options to migration by creating decent employment opportunities (wage/self-employment) for rural young women and men in the agrifood sector. With more than 70 million unemployed youth worldwide and 156 million young workers living in poverty, youth employment is a top policy concern. Between 2015 and 2030, the combined population of Africa and Asia is projected to increase from 5.6 billion to more than 6.6 billion. In the same period, the number of people aged 15–24 years is expected to grow by about 100 million to 1.3 billion worldwide. Almost all of that increase will take place in sub-Saharan Africa (SSA), and particularly in rural areas, where the lack of decent employment opportunities is a common cause of poverty, food insecurity, and distress migration.

Since 2011, the ICA project has been implemented in three successive phases. It is currently active in Guatemala, Kenya, Rwanda, Senegal and Uganda (2019–2022), with financial support from SIDA. The ICA project supports countries in adopting and implementing youth -inclusive and employment-centred agrifood system development policies, strategies and programmes. Aligning with country and regional priorities, the ICA project proposes an integrated approach structured in five main outputs:

1) inception phase, mappings and priority setting;

2) knowledge generation for evidence-based policy development;

3) awareness raising and capacity development for youth-inclusive and employment-centred planning;

4) policy and programme development, with focus on agroterritorial processes of job creation;

5) boosting FAO tools and internal capacity to promote youth employment in agrifood systems in a gender-sensitive manner.

In Kenya, the ICA project plans to adopt youth-centeredvalue chain development approaches in two counties (Kakamega and Siaya), to accompany the implementation of the 2017 Kenya Youth in Agribusiness strategy.

1.3 About the value chain analysis study

In the frame of the knowledge component of the ICA, FAO and the government prioritized a set of value chains in the two counties for further analysis of their youth employment potential. The approach used is the Sustainable Food Value Chain Development (SFVC) paradigm. A SFCV is defined as: "the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources". (FAO, 2014).

This paradigm starts from the premise that food insecurity is foremost a symptom of poverty. Households that have sufficient financial resources at all times create the effective demand

that drives the supply of food. On the supply side, competitive improvements in the food system will reduce the costs of food products to consumers or increase their benefits. Value Chains (VCs), as engines of growth, create added value that has five components:

1) salaries for workers;
2) a return on assets (profits) to entrepreneurs and asset owners;
3) tax revenues to the government;
4) a better food supply to consumers; and
5) a net impact on the environment, positive or negative.

However, the potential of the sector to contribute to the creation of decent jobs for youth is far from being harnessed. Data on youth participation in agriculture is very limited. According to Kenya Youth Agribusiness Strategy (2017–2021), only 10 percent of youth are directly participating in the sector. Even though this percentage seems excessively low compared to neighbouring countries, there is a general trend of youth moving away from agriculture and rural areas as a whole. (FAO, 2019)

1.4 Objectives of the study

The youth-specific and gender-sensitive value chain analysis had the objective to assess the current engagement of youth in the specific value chains, as well as the specific challenges that youth face and the opportunities that could be tapped into for the generation of more and better jobs. The study sought to identify key issues, bottlenecks and leverage points in the selected value chains and propose a vision which would form the basis for an upgrading strategy with practical/actionable points which consider the triple bottom line of sustainability (economic, social and environmental) and improve opportunities for decent rural youth employment in the selected value chains, whether in self or wage employment. Special emphasis would be placed on youth access to finance.

1.5 Scope of the study

The scope of this study entailed the following:

i) **Establishing the target value chains in the two counties, and assess the size of the respective markets and potential for job creation and decent rural employment opportunities for youth.** FAO had identified potential value chains (VCs) - dairy and poultry in Kakamega; poultry, mango, avocado, and fish in Siaya and this study would focus on these VCs.

ii) **Developing an upgrading strategy and action plan**, to be validated by all relevant stakeholders for a youth-centereddevelopment of the target value chains in Kakamega and Siaya.

The value chain report would:

- **Provide maps of the value chains**, showing physical and financial flows and key players, including identifying the potentially suitable youth and youth groups and private sector players working in the target value chains.
- **Provide key statistics and synthetic information on end markets for each value chain, market dynamics and opportunities**; Actors' contribution to changes in prices along the value chain; Competitiveness of the value chain(s), determining how to create competitive advantages for the targeted sectors in the context of local and regional trends, having in mind the context of the youth population.
- **Assess and describe the current level of youth engagement** in each core value chain function (production, aggregation, processing and distribution), with focus on the challenges that the youth face, the most common business models/production methods that they adopt and the employment and working conditions that they face such as (employment status, type of contracts for wage workers, formality/

informality, access to social security, pay levels, application of occupational safety and health measures).

- **Assess in detail the current access to finance of the rural youth in the targeted areas and value chains** (through desk research and primary data collection - i.e. focus group discussions (FGDs); - Collect key data from the suppliers of financial services: a) Financial Institutions (formal and informal - including insurance and leasing provision) active in the selected counties with presence of branch network; b) assessment of available financial products suitable for rural youth and young agripreneurs uptake (i.e. length of the tenure, customized payments); c) existence of digital finance players providing youth Agri–finance service (input finance, trade or other finance); d) mapping any other initiative in the selected counties promoting access to finance to rural youth ; highlighting any other form of financial arrangements in the selected value chains (i.e. contract farming).
- **Evaluate the demand of financial services from the rural youth in terms** of: a) level of youth information on the existing financial products (financial literacy), b) level of collateral available, c) presence of financial footprints; d) level of unmet financial needs.
- **Assess in detail the supply of non-financial service**, as public and/or private Incubators and other business development services (BDS) accessible for the rural youth engaging the agribusinesses in the selected areas.
- **Appraise the demand of non-financial service from the rural youth and agripreneurs** (i.e. training, in business planning and market linkages).
- **Identify the major capacity gaps within the financial institutions** dealing with the rural youth and vice versa that may be object of FAO interventions.
- **Assess the supply and demand of value chain support services and their capacity to address youth needs** (e.g. seeds provision, agro-inputs access, financial services, etc.) Consider providers targeting youth explicitly or providing youth-inclusive services.
- **Identify promising value chain business and employment opportunities for Youth Employment** in each node of the value chain as well as in service provision.
- **Provide an overview on the enabling environment for youth engagement** in the selected value chain (national policies, regulations and laws; informal sociocultural elements such as norms, unwritten codes of conduct, cultural preferences and habits to take into consideration in developing the value chains; physical infrastructural elements such as energy, roads, ports, water, and telecommunication networks; Mechanization, Information Communications and Technology (ICT) and digital agriculture; organizational and cooperation).
- **Assess value chain (s) governance** and youth representation within governance mechanisMs
- **Identify systemic constraints and upgrading opportunities including recommendations** (intervention matrix); i) Root causes of constraints limiting the generation of decent jobs for youth in the selected value chains (explaining which ones are common to the different value chains (VCs) and which ones are specific to each of them), ii) Leverage points and upgrading opportunities for youth employment and decent work promotion, iii) Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of each value chain in terms of youth participation in different value chain segments and service provision.
- **Annex at least two examples/case studies** of youth experiences in each value chain.

1.6 Research design and methodology

The study utilized a snowball research design that entailed identification of a small sample of value chain actors within each value chain (VC) and then using these contacts to develop a sampling frame of actors to be interviewed. A purposive sampling technique was then used to select respondents for interview. This technique enabled identification of one group of youth farmers who in turn referred the researchers to the other groups with similar characteristics and so on. Therefore, similarly to other studies that adopt the snowballing research design, this study is subject to a potential bias such as a community bias. Possible overrepresentated characteristics of the interviewed respondents are: agripreneurs as opposed to the wage employed, and youth with higher level of education as well as other social capitals. Interviews were carried out with actors along value chain nodes including producers, aggregators, processors, traders and distributors and input suppliers. Other actors in the VCs such as financial institutions and providers of business development services (BDS) were also targeted. Due to the research design and the sampling methodology, results presented in this study, especially descriptive statistics of interviewed respondents are not representative of the respective counties' agrifood sector. Thereafter, a detailed value chain analysis was carried out for all the selected VCs using quantitative and qualitative research methods. Quantitative methods were used to generate numerical data based on the use of mainly closed-ended questions to target respondents, while qualitative methods were applied to explore and understand people's beliefs, experiences, attitudes, behavior and interactions and to generate non-numerical data. These were based on the use of open-ended questions to target respondents during focus group discussions (FGDs) and Key Informant Interviews (KIIs).

The study achieved a total of 526 interviews with value chain actors in the two counties against a target of 400 (131.5 percent achievement), a total of 19 focus group discussions against a target of 24 (79.16 percent achievement) and a total of 68 key informants against a target of 75 (90.67 percent achievement) as presented in the table below.

Table 1. Breakdown of interviews carried out

S/ No.	Technique	Quantity /No	Number of interviewees							Youth respondents per location			
			Age bracket					Gender		Kakamega		Siaya	
			<18	18–25	26–30	30–35	>35	M	F	M	F	M	F
1)	Individual producer interviews	133	–	–	10	25	98	87	46	12	10	11	2
2)	Individual interviews with youth active in the selected VCs	183	6	48	63	66	–	110	73	42	19	68	54
3)	Value chain actor interviews	210	1	3	13	49	144	105	105	27	18	13	8
4)	Focus group discussions (FGDS)	19	–	–	–	–	–	–	–	–	–	–	–
5)	Key Informant Interviews (KIIS)	55	–	–	–	–	–	–	–	–	–	–	–
6)	**Total**							**302**	**224**	**81**	**47**	**92**	**64**

The data collection exercise involved undertaking of the following tasks:

i. **Pre-testing of the data collection tools**: Prior to commencement of data collection, the consulting team pre-tested the data collection tools. The data collection tools were tested for clarity, flow and effectiveness. A pilot assessment was undertaken prior to the commencement of the actual data collection exercise in-order to further test whether or not the questionnaires adequately captured all the information required in the study. Suggested amendments to the questionnaires based on the pilot were be discussed with the client after which the final questionnaires were developed. A pilot study sample of 10 value chain actors was used to pre-test the data collection tools.

ii. **Recruitment of enumerators:** We employed the services of young enumerators (9 young women and 9 young men) who we rigorously trained on research methodologies, and who as a measure of quality control, possessed the minimum academic qualification of a university degree preferably in agriculture or agri-business and had some experience with data collection. All the enumerators were local residents of the two counties so as to ease their familiarity with the geographic environment, the local language, the social norms and culture of the local communities.

iii. **Training of Enumerators:** Enumerators were exposed to the following training modules:

- **Overview of the study:** enumerators were briefed on the ICA Kenya Project and introduced to the study objectives, study methodology and study questionnaires. In addition, they were briefed on their expected roles and protocols to be observed during data collection.
- **Interviewing**: Enumerators were trained on basic techniques and ethics of conducting successful interviews and essential characteristics of a good interviewer.
- **Questionnaires**: We highlighted the importance of the questionnaires as a standardized research instrument; highlighted the difference between "reading questions' and "asking questions' and discussed the best way of asking questions and recording responses.
- **Sample selection**: demonstrated the importance of selecting the appropriate respondents in the field and outlined the various sampling methods available.
- **Quality standards**: introduced the quality measures to be used in the field (quality checklist) and highlighted general and specific expectations of the consulting firm from the field team.

1.7 Data cleaning, processing and analysis phase

Upon completion of the data collection exercise, primary data obtained from the fieldwork was consolidated, cleaned and transformed through data analysis into meaningful information for purposes of preparing the study findings. Quantitative data was analysed through descriptive statistics using the Statistical Package for Social Sciences (SPSS) to prepare frequencies of various variables, while visual representation of the findings was done using graphs, tables and pie charts. Qualitative data collected was entered into the SPSS as string variables. Thereafter, related statements were arranged into meaningful order as per the emerging themes and these were used to prepare the study findings.

1.8 Report preparation and submission

Upon conclusion of the data analysis, the resulting information from the primary data analysis in addition to the prior collected secondary information from literature review as well as the recorded observations were used to prepare a draft study report giving comprehensive details on the study findings in the format agreed upon with the client. The draft report was then submitted to FAO for review and sharing of feedback. The consulting team revised the draft report incorporating feedback from the FAO team. This draft was presented to stakeholders for validation.

1.9 Stakeholder validation workshop

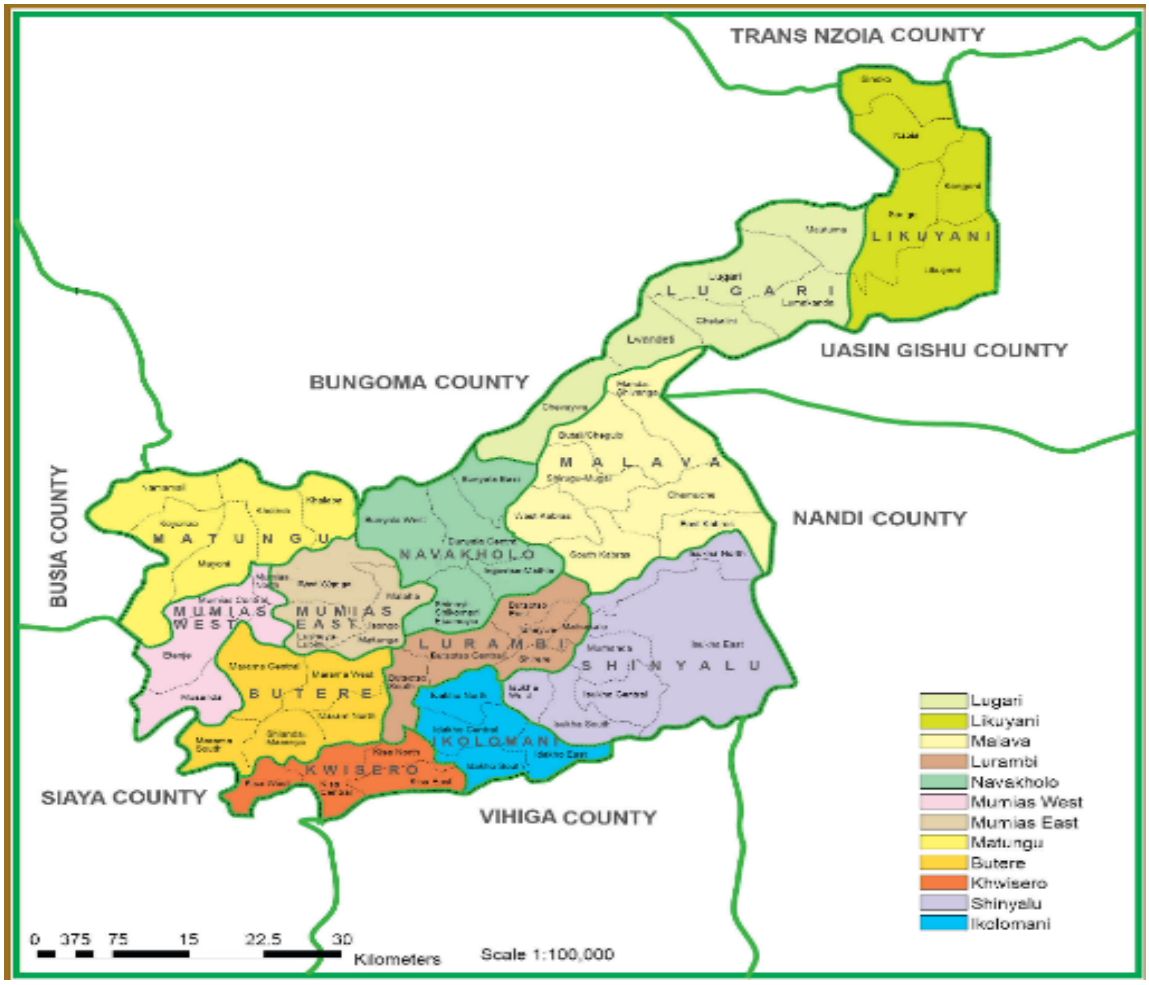
Two stakeholder validation workshops were held to review the draft report and validate the findings. One workshop was held in Siaya County at Distinction Gardens Hotel, on 22 March 2021, while another workshop was held in Kakamega at the Golf Hotel on 24 March 2021. Upon conclusion of the stakeholder workshops, the consulting team prepared the Final Value Chains Study Report.

2. Study findings for Kakamega county

2.1 Overview of Kakamega County

Kakamega County is located in the Western part of Kenya and borders Vihiga County to the South, Siaya County to the West, Bungoma and Trans Nzoia Counties to the North and Nandi and Uasin Gishu Counties to the East. It is divided administratively into 12 sub-counties and 60 wards. The sub-counties are Lugari, Likuyani, Malava, Lurambi, Navakholo, Mumias West, Mumias East, Matungu, Butere, Khwisero, Shinyalu and Ikolomani. This county covers an area of 3 051.3 Km^2 and is the fourth most populous county with the largest rural population.

Figure 1. Map of Kakamega County



Source: Kakamega CIDP 2018–2022. Also available here: https://kakamega.go.ke/map-of-kakamega/

2.1.1 Ecological conditions

Kakamega County has two main ecological zones: the upper medium (UM) and the lower medium (LM). The upper medium covers the central and northern parts of the county including Ikolomani, Lurambi, Malava, Navakholo, and Shinyalu, which practice intensive maize, tea, beans, and horticultural production mainly at small scale levels; and Lugari and Likuyani where small-medium scale farming is practiced. The LM covers a major portion of the southern part of the county that includes Butere, Khwisero, Mumias East, Mumias West, and Matungu. In this zone, the main economic activity is sugarcane production, with some farmers practicing maize, sweet potatoes, tea, ground nut, and cassava production.

The county is endowed with diverse natural resources, which include water and natural forests. The main water sources include the eight main rivers in the county: Rivers Nzoia, Yala, Lusumu, Isiukhu, Sasala, Viratsi, Kipkaren and Sivilie. The county has a natural forest covering

Shinyalu and Lurambi; other farm forests have been integrated with agriculture. It has one natural gazetted forest covering 188.7 km^2 and one non-gazetted forest that occupies 26.5 km^2. Commercial forests are found in the northern parts of the county. These forests are home to indigenous trees, large species of birds, butterflies, monkeys, snakes, baboons, hares, and rabbits. They also attract tourism and provide research sites for a number of institutions (Kakamega CIDP, 2018–2020).

2.1.2 Population size and composition

As per Kenya National Bureau of Statistics (KNBS, 2019) census results, Kakamega County had a total population of 1 867 579 people, of which 897 133 were male and 970 406 were female, which results in a population distribution of 48.04 percent male and 51.96 percent female as per the table below.

Table 2. Kakamega county population

Sex	Number of Persons	Percentage (%)
Male	897 133	48.04
Female	970 406	51.96
Intersex	40	0.00
Total	**1 867 579**	**100.00**

The county youth population stood at 586 600 (31.42 percent of the county population), of which 275 129 (46.9 percent) were young men and 311 671 (53.1 percent) were young women as per the table below.

Table 3. Kakamega youth (16–35 years) population

Sex	Population	Percentage (%)
Male	223 904	46.18
Female	260 987	53.82
Total	**484 891**	**100.00**

2.1.3 Employment statistics

As per KNBS 2019 census only 39.4 percent (736 590 persons in labour force) of Kakamega county population was working, while 2.6 percent (49 344) were seeking work or work was unavailable and 57.9 percent (1 081 645) were outside the labour force. Those seeking work were largely the youthful population representing those people with the necessary skills and qualifications but who reported that for the period of two weeks prior to the census (August 2019) were actively seeking for the jobs they were qualified in.

2.1.4 Status of agricultural activities in Kakamega County

Agriculture is the economic backbone of Kakamega County as it accounts for over 65 percent of the total earnings. A large proportion of the county population is employed either directly or indirectly in this sector. This county is not food self-sufficient and sources for the food deficits from neighboring counties such as Uasin Gishu, Vihiga, Busia and to some extent Kiambu county and Uganda. The two main categories of crops grown in the county are food crops and industrial crops depending on the use of the harvested produce. A third category is horticulture crops (multipurpose). Food crops are either cereals (maize, sorghum, finger millet, and rice), pulses (beans, peas and grams) or roots/tubers (cassava, s/potato, arrow roots). Most cereals have recorded increased production (due to increased area under production) in recent years while some pulses have declined due to some factors e.g. diseases. The main crops produced are: maize, beans, sweet potatoes, cassava, bananas, sorghum, finger millet, local vegetables, rice, tea, sugarcane and horticulture.

The county is also endowed with good climate for livestock husbandry and the main type of livestock reared include: cattle (dairy, zebu), poultry (indigenous chicken, layers, broilers,

ducks, turkeys, geese and pigeons), bee keeping, pigs, goats (local goats, dairy goat), hair sheep and rabbits. Fish farming is one of the eight flag ship projects being implemented by the County Government of Kakamega. The Department of Fisheries is currently implementing the Kakamega County Fish Farming Programme which does pond construction and renovation and provides fish farm subsidies (fingerlings, feeds). As at June 2017 the county had: 7 845 fish farmers operating 8 336 fish ponds covering an area of 2 536 300 m^2; fish production was 1 627 500 Kgs valued at K Sh. 450 million. The main culture species are Nile Tilapia and Catfish. The main production unit is the earthen fish ponds. The county has six private hatcheries which supply quality male tilapia fingerlings and also catfish fingerlings (Kakamega CIDP, 2018–2022).

2.2 Value chain analysis for all prioritized value chains in Kakamega County

1.2.1 Youth participation in the Prioritized value chains

The study sought to establish youth participation in various value chains and found that, from a total of 128 youth interviewed (63 percent male and 37 percent female), 42 percent were engaged in dairy, 15 percent in fish, 23 percent in poultry and 20 percent in soya as per the table below.

Table 4. Youth participation in agricultural value chains in Kakamega County

Value chain engaged	Gender		Total	Percentage (%)
	Male	Female		
Poultry	19	17	**36**	**23**
Dairy	34	12	**46**	**42**
Fish	12	9	**21**	**15**
Soya	16	9	**25**	**20**
Total	**81**	**47**	**128**	**100**
Percentage (%)	**63**	**37**	**100**	

1.2.2 Poultry value chain

i) Current performance of poultry value chain

Poultry rearing is prevalent in Kakamega, with 62.7 percent of households engaged in this activity. The main type of chicken reared is indigenous and improved kienyeji chicken and exotic layers and broilers. This is mostly not an exclusive activity but it is blended with other farming activities and most of the farmers are engaged in subsistence production (97 percent), with only 3 percent engaged in commercial farming (KNBS, 2019).

ii) Brief description of the poultry value chain structure

End market: Nationally, the poultry sector contributes about 7.8 percent to the national Agricultural Gross Domestic Product (GDP) and about 0.34 percent of the total GDP (Kenya Economic Survey 2018), In addition, small scale poultry farming is practiced by over 80 percent of the rural farmers many of whom are women.

As in most East-African countries, Kenya has two different poultry markets. The market of the traditional, home kept chicken which roams around. Besides that, there are the fast-growing hybrid broiler chickens. Consumption of poultry meat in Kenya was predicted to increase from 54.8 thousand metric tonnes in 2000 to 164.6 in 2030, and from 6 to 30.5 thousand metric tonnes in Nairobi within the same period (Robinson and Pozzi, 2011), due to urbanisation, population growth and economic growth. To meet this expected demand growth, poultry production in Kenya is expected to increase from 56.9 to 1 666 metric tonnes by 2030 (FAO, 2008).

Demand for poultry products such as meat and eggs was very high but supply was limited. A survey commissioned by the Kakamega County Government showed that the county produced slightly more than 35 million eggs every year, compared to an annual demand of 170 million eggs. The task force's report revealed the county imported eggs and chickens from as far as Central Kenya and neighbouring counties such as Uasin Gishu and Nandi, to meet its demand for chicken meat; which is a cherished delicacy in the area.

Production: Production of poultry in Kakamega County is still low evidenced by the prevalent deficit in supply of chicken and chicken products to satisfy the local demand due to the heavy consumption of poultry meat.

The main poultry breeds produced were the local indigenous chicken (IC), improved indigenous chicken including the Kuroiler, Kenbro, KARI Kienyeji varieties, crossbreeds and exotic layers and broilers. It was noted that many farmers had reduced production of exotic broilers and layers due to limited market and declining demand for this type of chicken arising from the high preference for indigenous chicken. The preference for indigenous chicken was due to their ability to survive under harsh conditions, feeding of these chickens was also mainly done with food left overs. These chickens were also preferred due to their tasty meat products. Preference for improved indigenous chicken was due to its higher productivity and faster attainment of weight while having enhanced capabilities of surviving harsh weather conditions.

Scarcity of hatching eggs and the high cost of establishing and running a hatchery were identified as some of the most significant challenges in scaling up poultry production in the county. It was found that farmers sourced one-day chicks from other counties such as Uasin Gishu, Nakuru, Kiambu and also neighboring country Uganda. To address the challenge of cost and availability of chicks, the County Government of Kakamega established a subsidy programme to supply farmers with improved one-day-old chicks of Kenya Agriculture and Livestock Research Organization (KALRO) breed - at half price of K Sh 50 per chick targeting youth groups (60 percent) and women groups (40 percent). The County targets to distribute 320 000 chicks by 2022, as per the CIDP (2018–2022).

- **Feeding:** It was found that poultry are mainly fed on commercial feeds depending on the age of the birds and blended with traditional feeds such as maize grains and vegetables to mitigate the high costs of commercial feeds. It was established that extensive use of commercial feeds was not viable for most farmers due to the high costs of these feeds. This was also one of the main reasons why most of the farmers sold chicken before full maturity to reduce on feeds consumption.

- **Housing:** It was established that although many households had built housing structures for their poultry, many other households opted to dedicate one of the rooms in their homes for use as chicken housing to mitigate against theft of the chicken which was quite rampant. "We have secured our projects poultry house with an electric fence to guard against theft of chicken. However, we are not 100 percent secure since perpetrators of chicken theft have ways of accessing the house despite the electric fence" - New Era Youth Group, Kakamega County.

- **Disease management:** The study found that New Castle Disease (NCD), Fowl Pox, Typhoid and Gumboro were the most prevalent diseases affecting poultry farming in the county. This challenge was compounded by limited extension services, limited number of agrovets, high costs of vaccines and sometimes limited stock of vaccines for Fowl Pox and Typhoid as most suppliers stocked vaccines for New Castle Disease (NCD).

Aggregation: In Kakamega, aggregation was carried out by middlemen and farmer cooperative societies. For example, Butere - Mumias Cooperative Society is one of the groups engaged in poultry aggregation. This cooperative has a membership of 446 farmers, although only 183 are considered active and they are involved in collecting live chicken and eggs from the farmers for eventual supply to the retailers and wholesalers as well as some consumers.

[1] https://www.thepoultrysite.com/news/2014/07/kenyan–county–farmers–in–rush–to–meet–chicken–eggs–demand

The cooperative society was also involved in delivery of poultry to identified markets such as schools, restaurants, hotels and in weddings and funerals. On average the cooperative collected and sold 100–300 live chicken per week, making and average of K Sh 50–00 per live chicken in profit. Selling through the cooperative was more profitable for farmers than selling through the middlemen, although most farmers preferred selling to the middlemen due to the need for quick cash. In some instances, farmers also sold chicken directly to consumers.

Some of the challenges faced in aggregation include:

- **High transportation costs**: Accessibility to the farm gates is mostly through use of motorcycles which are limited on the quantities ferried hence the riders make several trips increasing the costs of chicks and chicken.
- **Purchasing of diseased chicks and chicken** which causes losses. Aggregators don't have capacity to assess or test the health of the chicks and chicken conclusively hence heightening the risk of buying sick birds.
- **Chicken theft**: theft of chicken is a serious concern in Kakamega County and this affects aggregators as well causing business losses.
- **Lack of a slaughterhouse**: the aggregators do not have their own abattoirs for slaughtering chicken and slaughtering is done at home. This limited the scope of markets that the aggregators can sell to.
- **Weather changes** affect chicken production and cause challenges in aggregation as well. Egg and meat production pattern are affected by seasonal fluctuations of weather because periods of high temperature and sunshine intensity make the birds to drink more water and reduce feed intake which many at times results to high mortality of the chickens, low egg production and low feed conversion ability of the birds to meat, hence, low meat production. Seasonal fluctuations influence the emergence of new poultry diseases and increased its distribution. High rainfall on the other hand results to stress on the chicken which hampers their productivity rate. Low production results to scarcity of chicken and chicken products which poses a supply challenge for the aggregators.
- **Unreliable supplies**; no guaranteed supplies since farmers sell at their pleasure.
- There were also other challenges noted such as breakages of eggs during transportation and also due to mishandling.

Processing: In Kakamega County, most of the poultry was sold as live chicken and there was no poultry processing plant yet established which was attributed to the low supply of chicken. The processing currently done was manual slaughtering and defeathering of chicken done for some hotels and food eateries. Farmers who were engaged in primary processing carried out this function at home. The hotels on the other hand bought live chicken and slaughtered them based on demand for chicken meat. It was noted that the processing was on a small scale.

Main challenges faced by processors are:

- **Lack of capital**: processors interviewed cited lack of finances for acquisition of processing equipment and machines. "We currently buy and sell live chicken on behalf of our members due to lack of capital required to purchase processing equipment and machinery" - Butere Mumias Cooperative.
- **Low production capacity**: Poultry production was low and did not guarantee steady supply for processing of chicken. The county imported eggs and chickens from as far as Central Kenya and neighbouring counties such as Uasin Gishu and Nandi, to meet its demand for chicken meat; which is a cherished delicacy in the area.

Distribution: Distribution and marketing of poultry was majorly unstructured. The following are the current distribution channels:

- **Farmers to middlemen/brokers** - The middlemen/brokers collect live chicken and eggs at the farm gate. Whereas they provided the farmers with quick cash, their prices were usually the lowest. Their buying price was Ksh.400–450 during normal season and Ksh.450–500 during high/festive season. The middlemen sold the products to institutions, hotels and consumers. The market price during normal season was K Sh.600/= and K Sh.700/= a piece during high/festive season. The prices for Kienyenji chicken was mainly dependent on weight while chicken for rearing was purchased per age.

- **Farmers to cooperative society** - The cooperative societies bought from their registered members for onward selling to already identified markets such as schools, restaurants and hotels. They bought live chicken equivalent to the orders received since they did not have adequate storage facilities to mitigate the risk of theft. The cooperatives bought chicken at slightly higher prices compared to the middlemen/brokers at K Sh.500/= a piece during normal season and K Sh.600/= a piece during high/festive season.

- **Farmers to consumers** - This was the most preferred distribution channel where the farmers sold directly to end consumers. The consumers who were usually neighbors and other referrals collected the products at farm gate and bought the chicken at the prevailing market prices of K Sh.600/= and K Sh.700/= a piece during normal and high/festive season respectively.

The mode of transport used commonly in distribution of chicken were motorcycles and pick-up trucks when the quantities were high. The youth, mainly young males, were the main providers of transportation as individuals especially using the motorcycles. These youth either owned or lease the motorcycles. The services were charged per trip and were based on the distances covered.

Distribution challenges included:

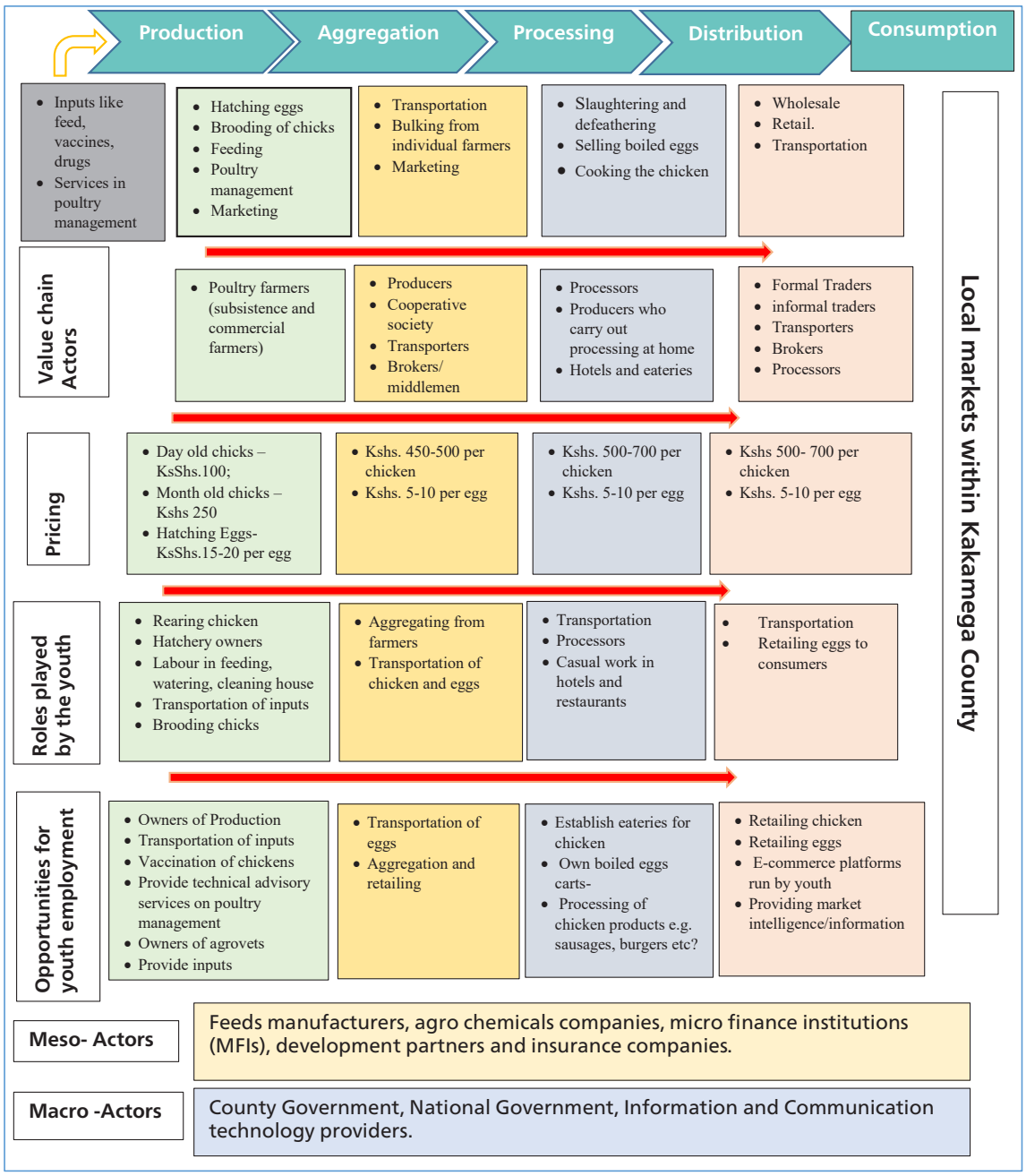
- **Poor road network**: in some parts of the county, the road network was very poor and the farms were not accessible especially using motorcycles and this limited market access for products. As a result chicken eggs were prone to breakage and instances of bird mortality were reported while on transit.

- **Lack of market information**: it was found that farmers lacked adequate market information especially on the demand-supply cycles for different sub-counties.

- **Cheap imports from Uganda**: It was established that chicken and eggs coming from the Ugandan market was cheaper than local products by up to 20 percent. For example, eggs coming from Uganda sold at an average price of K Sh 5 per egg, while chicken would sell at K Sh 350–400 per bird. This created unfair competition for locally produced poultry products.

iii) Poultry value chain map, Kakamega county

Figure 2. Poultry value chain map for Kakamega county



iv) Description of youth current engagement in the poultry value chain

From the sample size of the 128 youths interviewed 23 percent (n=36) were engaged in the poultry VC. It was established that 31 percent of youth were involved in poultry production, while 14 percent were in aggregation, 11 percent in processing, 25 percent in distribution, and 19 percent as input suppliers.

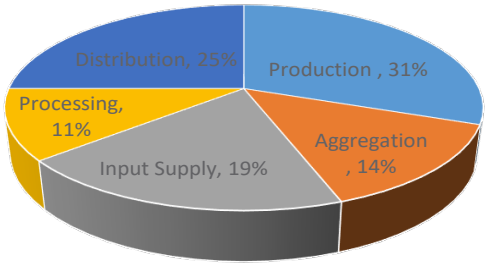


Figure 3. Type of engagement of youth in the poultry value chain in Kakamega County

i) Nature of youth engagement in poultry value chain

The study found that 55.6 pecent (n=20) of the youth in the poultry VC were engaged as agripreneurs (both formal and informal businesses), 5.6 percent (n=2) were engaged as casuals and 38.8 percent (n=14) were engaged either as contributing family workers, in permanent employment and as seasonal workers. In addition, it was noted that from amongst youth agripreneurs, 65.5 percent were male and 34.5 percent were female as presented in the table below.

Table 5. Youth engagement in the poultry VC by type of employment

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	13	65.5%	7	34.5%	20	55.6%
Casual worker	1	50%	1	50%	2	5.6%
Contributing family worker[1]	–	–	–	–	14	38.8%
Permanent employee/wage worker	–	–	–	–		
Seasonal/part-timeemployee/ wage worker	–	–	–	–		
Total	–	–	–	–	**36**	**100%**

It was found that young men were slightly more represented in the sample than young women, with 52.78 percent of youth actors in the poultry VC males and 47.22 percent females. With reference to the different VC nodes, young men seem to be more represented in production, while young women in processing. Representation seems more balanced by gender in the remaining nodes. Among these actors, 11.11 percent were in the age-bracket 18–25 years, 30.56 percent were 26–30 years and 58.33 percent were in the age bracket of 31–35 years.

Table 6. Sex and age of poultry VC actors in Kakamega County

Type of Engagement	Gender		Total	Age (Years)							
				16–17		18–25		26–30		31–35	
	M	F		M	F	M	F	M	F	M	F
Production	8	3	11	0	0	1	1	3	2	4	0
Aggregation	2	3	5	0	0	1			1	1	2
Input Supply	4	3	7	0	0		1			4	2
Processimg	0	4	4	0	0				3	0	1
Distribution	5	4	9	0	0			1	1	4	3
Total	**20**	**16**	**36**	**0**	**0**	**2**	**2**	**4**	**7**	**13**	**8**
Percentage	**52.8%**	**47.2%**	**100%**	**0%**	**0%**	**5.6%**	**5.6%**	**11.1%**	**19.4%**	**36.1%**	**22.2%**

With regard to weekly incomes, it was established from the youth specific questionnaire (n=61) that 23 percent (n=22) of the youth in poultry VC earned a weekly income of up to K Sh.1 000, 5 percent a weekly income of between K Sh. 1 001 to 2 000, 9 pecent earned a weekly income of K Sh. 2 001–3 000, 18 percent earned an income of K Sh. 3 001 to 4 000 per week, 23 percent earned K Sh. 4 001–5 000, 9 percent earned K Sh. 5 001–10 000 per week and 14 percent earned over K Sh. 10 000 per week.

[2] Disaggregated data for contributing family workers, permanent employees and seasonal/part-timeworkers was not available.

Table 7. Average weekly income for poultry value chain actors

Poultry VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001 – 2 000	2 001– 3 000	3 001 – 4 000	4 001 – 5 000	5 001 – 10 000	Over 10 000	Total
Agripreneur	4	1	2	4	4	2	3	**20**
Casual Worker	1	–	–	–	1	–	–	**2**
TOTAL	5	1	2	4	5	2	3	**22**
Percentage (%)	**23%**	**5%**	**9%**	**18%**	**23%**	**9%**	**14%**	**100%**

Regarding education attainment of VC actors, it was found that all actors had basic literacy and numeracy skills having achieved a minimum of primary level education. 11 percent of producers had achieved secondary school education and 88.9 percent had achieved college or university level education. All aggregators (100 percent) had achieved a minimum of college education. For processors, 50 percent had achieved post-secondary education and 50 percent had attained college or university education. For distributors, 12.5 percent had achieved primary level education, 50 percent had attained secondary school education, 12.5 percent post-secondary or tertiary level education and 12.5 percent had attained college level or university education. These statistics on education attainment of VC actors, differ from the census data available in KNBS, 2019 because of the purposive sampling method used in selecting the respondents. In addition, it was also noted that a significant proportion of youth engaged in poultry production and aggregation had achieved college level or university eduction.

Table 8. Education attainment of youth actors in the poultry value chain in Kakamega County

Value chain node	Education attainment in Percentage				
	Primary	Secondary	Post-secondary	College or University	Total
Producer	–	11%	–	88.9%	100%
Aggregator	–	–	–	100%	100%
Processor	–	–	50%	50%	100%
Distributor	12.5%	50%	12.5%	25%	100%
Input supplier	–	100%	–	–	100%

a) **Youth engagement in the production node**

Type of engagement: The production node was the most popular among youth with 41 percent of youth engaged in poultry production. Youth were engaged in production through brooding chicks, rearing chicken both indigenous and improved indigenous chicken for eggs and meat, while a few were engaged in hatching of chicks.

Level of engagement: 95.6 percent of youth were engaged in the production node as individual agripreneurs, mainly as informal businesses, while 4.4 percent were employed. 68 percent of the actors engaged mainly family labour in poultry production. The study found that most actors in the VC hired workers on temporary terMs Employees were mainly hired through referrals from friends and relatives and they were contracted as casual workers earning daily and weekly wages in the range of K Sh 250–300 or weekly earnings of K Sh 1 500–700 respectively and no other benefits were available. The key tasks by gender are listed in Table 10 below.

Table 9. Key tasks of young men and young women in poultry production in Kakamega

Value chain node	Male tasks in poultry production	Female tasks in poultry production
Production	• Construction and repairing of chicken house • Loading and offloading the feeds. • Cleaning of chicken coops in the poultry house • Feeding of birds • Arrangement of feeds and record keeping	• Egg collection • Vaccination and record keeping • Cleaning of the feeds storage facilities • Selection and picking of eggs • Washing and cleaning up the poultry house • Cleaning of chicken house and feeding the birds

Youth challenges in production:

- **Lack of land**: many youths lack access to land to establish poultry business. The young women were even more disadvantaged since they are culturally termed as "temporary residents" hence parents/guardians are not willing to give them land space to rear poultry.
- **Limited information**: youth lacked information on technical aspects of poultry production and also on markets for poultry products.
- **Limited extension services**: youth faced challenges in accessing extension and other business development services (BDS).
- **High costs of feeds**: costs of chicken feeds were very high which made the business less attractive since many youths cannot afford the cost of feeds and also lacked the technical knowhow to formulate their own poultry feeds.

Youth employment and business opportunities in production:

- **Brooding**-youth can be engaged in buying one-day old chicks and feeding and taking care of these chicks for one month and then selling them to farmers. The cost of one day old chicks was K Sh 100 and the cost of one-month old chicks was K Sh 250[3]. This was identified as the most viable business opportunity for youth to engage in the poultry value chain.
- **Feed formulation**-Feeds were a major challenge in poultry production due to high costs of these inputs. Indeed, chicken feeds account for a substantial proportion (Up to 80 percent) of production costs for poultry. This provided an opportunity for youth engagement in feeds formulation and also for youth to train farmers on feeds production. The study found that a market exists for poultry feeds and farmers would be willing to pay for training on feeds formulation since this would contribute to lowering costs of feeds. By making own feeds, it is possible to bring down cost of feeds to account for 50–60 percent of production costs.[4] Indeed, by making own feeds using locally available raw materials such as maize, maize germ, fish meal, soya beans and sunflower, farmers are able to save up to K Sh 900 per 70 Kgs bag of feeds which is quite substantial.
- **Offering vaccination services to poultry farmers** - many farmers reported that chicken diseases were a challenge and it was also problematic to obtain quality and reliable vaccines. It is proposed that youth could be trained as community - based extension

[3]A gross margin analyisis for chicken brooding is presented in the appendices.
[4]A gross margin analysis for feeds formulation is presented in the appendices.

workers for management of chicken diseases such as New Castle Disease (NCD). Youth could offer vaccination services to the farmers at a fee of about K Sh 5 per bird. Having factored costs of vaccines and transportation, youth can earn a net of K Sh 2 per bird for vaccinating chicken. By vaccinating an average of 2 000 birds per week, youth can earn K Sh 8 000 income weekly from this business.

- **Training of farmers**: Youth could take up opportunities for training farmers on poultry production and on feeds formulation for the poultry enterprise.
- **Farm management:** the youth could be involved in managing poultry farms through provision of supervision and management of poultry farMs During the study it was found that youth were hired on casual basis to take care of poultry farMs By pursuing opportunities to in management of poultry farms youth can combine these activities with other types of engagements to enhance their earnings. For example, supervision and management tasks could be carried out at scheduled times; morning and evening, and hence leave the youth with time to engage in other tasks.

b) Youth current engagement in the aggregation node

Type of engagement: It was found that 14 percent of youth were engaged in aggregation. The youth are mainly engaged in aggregation as transporters for the middlemen and cooperative societies using motorcycles and this mainly involved young men. Some youths were also engaged as middlemen, mainly providing aggregation services for eggs.

Level of engagement: Most of the actors were individual agripreneurs (87.5 percent) in informal businesses, while 12.5 percent were employed mainly by aggregator cooperatives. Membership of these cooperatives consisted on individuals cutting across various age groups. The study found that most actors (71.6 percent) in the VC hired workers on temporary terms and the employees mainly worked without contracts. Employees were mainly hired through referrals from friends and relatives and on average these workers earned K Sh 100–200 per day (8–10 hours per day) without any other benefits. Regarding key tasks performed by young men these mainly consisted of transportation and sourcing of chicken and eggs while that for young women consisted of egg collection for aggregators.

Table 10. Main tasks performed by young men and women in poultry aggregation in Kakamega

Value chain node	Male tasks	Female tasks
Aggregation	• Transportation and sourcing for the chicken and eggs	• Egg selection, and collection and packaging for aggregators

Youth challenges in aggregation:

- **Lack of adequate capital**: youth lacked adequate capital to participate in aggregation business since this required a large amount of investment to buy chicken or eggs products in bulk for sale in the market.
- **Price competition**: it was established that imported chicken and eggs coming mainly from Uganda created unfair competition for locally produced poultry products thereby making the aggregation business difficult and unattractive.
- **Reliability and consistency of business**: it was found that due to inconsistent production, aggregators faced challenges with reliability and consistency which made the aggregation unviable.
- **Chicken theft**: during interviews with poultry value chain actors in Kakamega it was established that poultry theft while in transit was a significant challenge faced by poultry value chain actors.

Youth employment and business opportunities in aggregation:

- **Formation of cooperatives**: youth have an opportunity to establish poultry cooperatives to enable aggregation of chicken and eggs. Through this model, the youth can be able to mobilize capital and also negotiate with off takers for purchase of chicken and chicken products. For example, youth can buy mature birds from farmers at K Sh 400 per bird and sell to hotels and restaurants at K Sh 500 per bird, making an average of K Sh 100 per bird. Having factored costs of transportation and other variable costs youth can make a net profit of K Sh 50 per bird. With a capital of K Sh 100 000 a youth aggregator cooperative can buy and sell 250 birds per week, making an average of K Sh 12 500 weekly.

Youth current engagement in the processing:

Type of engagement: It was found that 11 percent of youth were engaged in processing of poultry products. It was noted that the processing node was not fully exploited by the youth despite the numerous opportunities available. Most of the processing was done manually and mainly entailed slaughtering chicken, cooking chicken and boiled eggs.

Level of engagement: It was found that 71.5 percent of youth were engaged in processing as agripreneurs while 28.5 percent were employed mainly as casual labourers in restaurants, hotels and eateries within Kakamega County. The youth were involved in boiling and selling eggs using push carts as agripreneurs, slaughtering and defeathering chicken for the farmers and aggregators and cooking chicken in hotels and restaurants as the owners of these establishments or employees. The tasks in this node of the value chain were performed almost equally by young men and women. The payment for the casuals was daily at K Sh 100–200 per day (8–10hours engagement per day) for those employed in hotels. For those employed to slaughter chicken, payment was K Sh 20–30 per live chicken slaughtered or defeathered. It was found that youth involved in processing had basic training on food safety and hygiene procedures and wore some protective clothing especially for those that slaughtered chicken which was done manually. It was also noted that no incidences of Occupational Safety and Health (OSH) accidents had been reported. However, wages paid for those who were employed were often very low and not adequate to cater for a decent living.

Youth challenges in processing:

- **Limited information**: youth lacked information on opportunities available within processing node of the value chain in addition to limited skills and capacities.

- **Lack of processing equipment**: youth face challenges with limited processing capacity for chicken since this was done manually and there was no established chicken slaughterhouses. This limited the kind of products they can be able to package for selling to the market.

- **Low chicken supply**: the limited supply of chicken within the County limited the opportunities for establishment of a chicken processing plant

Youth employment and business opportunities in processing:

- **Upscale cooking and selling of chicken products such as boiled eggs, chicken bitings.** These will be sold on the streets and market places where there is human traffic. For example, the average cost of one egg is K Sh 5 and when boiled the egg can be sold at K Sh 10, making an average profit of K Sh 5 per egg. By netting of variable costs such as energy for cooking, transportation to the market and others, youth can make a net profit of K Sh 3 per egg. By selling an average of 100 eggs per day youth can derive an income of K Sh 300 per day or K Sh 1 800 per week.

- **Provision of slaughtering and de-feathering services.** Youth can engage in provision of slaughtering and de-feathering services. Youth can organize themselves into cooperative groups to carry out this business in an organized way. It should be noted that these activities might involve occupational risks and therefore might not be adapted to younger youth below 18.

- **Egg shells as pig feed**: this will not only guarantee a clean environment especially for those selling boiled eggs but also provide a source of an additional stream of income.

c) **Youth current engagement in the distribution node of the value chain**

Type of engagement: From the findings of this study, 25 percent of the youth are engaged in the distribution node of the value chain. Youth provide transport services using motorcycles and also engage in selling chicken and eggs in retail and wholesale outlets. "Most youth engaged in distribution are young men since they ride motorcycles. The majority are young people between 18–35 years and many have attained secondary school education with a few having college education" - County Chief Officer, Livestock Department.

Level of engagement: 88 percent of youth were engaged in the distribution node as agripreneurs while 12 percent were engaged as casual workers. The main tasks of male youth included transportation of chicken and eggs, doing sales of eggs on trolleys and ensuring that products reach the end user, while tasks for female youth consisted of sourcing for markets for chicken, eggs and one-day old chicks and delivery of chicken.

Table 11. Main tasks performed by young men and women in poultry distribution in Kakamega

Value chain node	Male tasks	Female tasks
Distribution	• Transportation of chicken and eggs • Doing sales of eggs with the trolleys • Ensuring that products reach the end user	• Sourcing for markets for chicken, eggs and one-day-old chicks, etc. • Delivery of the chicken - using alternative means other than motorcycles such as on foot or using public transport popularly known as "matatus"

Youth challenges in distribution:

- **Poor road network** in some areas in the county, road network was poor especially during times of heavy rains and this made distribution work difficult with reported incidences of eggs breakage and chicken mortality while on transit. Riding in heavy rains also exposes the riders to flu and chest related illnesses especially for those not warmly dressed.
- **Low poultry production** which made the distribution role unviable since the number of riders was very high.
- **Lack of courier boxes and the resources to purchase them**, for safe transportation of eggs and baskets for transporting chicken

Youth opportunities in distribution:

- **Youth can establish partnerships with owners of chicken hatcheries to market and sell 'day-old chicks'**: This business model would entail working with owners of hatcheries where youth obtain orders from farmers requiring "day-old-chicks' and then working with hatchery owners, the youth place orders, collect and deliver the chicks to farmers as soon as the chicks as hatched. On average youth can make between K Sh 5–10 per chick for this service based on the distance covered. Stakeholders identified the most viable opportunity in the processing node of the value chain.
- **Provide transportation services**: youth can provide services to traders and producers by providing transportation services suing safe courier boxes and baskets for guaranteed safety of the products. A gross margin analysis for motor cycle business model established that youth can make a net profit of K Sh 4 000 per month from the business using a leased motor cycle or K Sh 3 100 per month using a purchased motor cycle.[5]

- **Online marketing**: Majority of the youth own smartphones and they are tech savvy, they can establish marketing platforms for the poultry products. Through these forums youth can source markets for chicken and then buy and trade in chicken with an average gross margin of K Sh 50 per chicken.

d) **Youth engagement in the extended value chain and in provision of support services in the poultry value chain**

Provision of inputs: about 19 percent of youth are involved in providing support services to the value chain. These include provision of inputs used in poultry production including feeds, vaccines, and drugs and hatching eggs. Youths are also involved in input supply such as provision of eggs for hatching, provision vaccination services at a fee or as employees of agrovet shops. "Youth employed in the agrovets have technical skills in veterinary and book keeping for the cashiers" sub-county Agriculture Officer, Shinyalu sub-county.

Youth challenges in the extended value chain:

- Poultry feeds and vaccines are very expensive and youth lack capital to establish business such as agrovets for those already trained.
- Lack of technical skills: many youths lack technical skills necessary to provide support services in the poultry VC.

Youth opportunities available in provision of services in the extended value chain:

- Youth can take up and engage in chicken hatchery business. For example, in Kakamega, a young individual named Hesbon Andika has fabricated a simple technology - Kerosene hatchery - which is capable of hatching one-day-old chicks. This technology is affordable and can be adopted by youth in the County.
- Youth who have a background training in livestock production or agribusiness can provide extension and technical services to poultry farmers at a fee thereby creating employment for themselves and others.

Occupational safety and health issues in the poultry value chain

- In general terms, working in the poultry value chain can carry serious health risks, including zoonoses and infectious diseases, exposure to agricultural dust and toxic gases, chemicals used at poultry farms (for disinfection, etc.). The work is often physically difficult and involves handling heavy loads, uncomfortable postures and movements. Activities considered more hazardous, especially for youth, include: risk of accidents for young males engaged in distribution using motorcycles, drugs and vaccines contamination and dust during cleaning of poultry houses.
- Nevertheless, no evidence of accidents was reported during our interviews and discussions
- OSH measures that were reported in the interviews and FGDs to be more commonly adopted include: wearing protective gears (helmets and jackets) by the youth motorcycle riders, putting on masks during cleaning and disinfecting the houses and chicken.

2.2.3 Dairy value chain

i) Current performance of dairy value chain

Dairy is a significant value chain in Kakamega and 53.7 percent of households' rear cattle (KNBS, 2019). The two types of cattle reared consist of exotic dairy cattle in 10.9 percent of the farming households, and indigenous cattle in 42.8 percent of the farming households

[5] Gross margins for motorcycle business model is provided in the appendices.

(20.3 percent and 79.7 percent respectively for cattle rearing households). Dairy production is also carried out alongside other farming activities, with most of the farming being done for subsistence and only a small number of farmers carrying out dairy farming on commercial basis.

Kakamega County currently relies on milk from the sub-counties of Lugari, Likuyani, Malava and Kwhisero where most of the commercial dairy farmers are based and the current milk production is estimated at 250 000 litres per day. Commercialization of dairy farming and establishment of a dairy processing plant is one of the County's 2030 flagship projects. Towards realization of this, the county begun the "**One Cow Initiative" program in which** 1 310 in-calf dairy cows were distributed to households targeting at least 20 households per ward. This initiative targeted to improve milk production by 135 000 litres. It is estimated that farmers produce an average of 5 litres per cow per day. However, for those practicing zero grazing, it can range between 15 to 25 litres per day per cow The County seeks to establish smart dairy units in each of the 12 sub-counties and has so far established two smart dairy units with 25 dairy cows in each unit. The programme is targeting to produce 6 000 litres of milk per day from the 12 sub-counties with each cow producing 20 litres per day. A smart dairy unit is a dairy unit in which producers are trained in management skills combined with the right barn structure, monitoring cow behavior, feeding schemes and milk quality for optimal dairy production. Monitoring of the cows is done through placing a wearable sensor device onto the cow's neck, tail, or leg for acquiring real time data to examine numerous factors like cow's behavior, activity, health, feed consumption, milk production, and fertility management. These are all geared towards optimizing milk production.

The smart farms are planned to act as the nucleus of the dairy plant. A nucleus is a large farm unit (plantation, large-scale farm) which guarantees a certain minimum provision of raw material for a large-scale processing plant or other downstream aggregation use, while the other part of the raw material is procured from smaller farmers who are linked throughout grower arrangements to the nucleus (Glover 1984; Brüntrup and Herrmann 2010). In this context the smart dairy units farms will provide a guarantee for a certain minimum milk supply to the county processing plant hence the plant can at the least be assured of a certain minimum production capacity and output.

The County was also offering subsidized artificial insemination (AI) services with 23 AI providers trained and incorporated on the AI Programme and 12 Motor bikes were distributed one per sub-county to facilitate mobility of AI service providers. The trained AI providers were youth majority of whom had already been contracted by the County Government. However, it was noted that there was still a gap in the provision of AI services due to a limited number of government extension officers. In addition, there was also a huge gap in feeds availability and farmers lacked capacity to formulate own feeds. Besides, the high costs of feeds was a challenge to many farmers.

ii) Brief description of the dairy value chain structure

End market: The demand for milk and milk products is on the rise in Kenya, where the annual per capita milk consumption is now estimated at 145 litres, more than five times higher than the milk consumption in other East African countries (Kaitibie *et al*., 2010). 53 percent of milk marketed in Busia, Bungoma, Kakamega, and Vihiga comes from outside the region with acute shortages of milk experienced for a period of three to four months between December and March (Wanjala *et al*., 2014). According to the Kakamega Dairy and Livestock status report of 2014, the county has an annual milk requirement of 197.6 million litres against the current production of 112 million litres.

Kakamega County production deficit is yet to be fully addressed hence the continuous influx of imports from neighbouring counties like Nandi. This deficit explains the current high market prices to end consumers of up to K Sh. 60 per litre as compared to the Cooperatives purchase price from farmers of K Sh. 25 per litre. The upcoming County processing plant is another upcoming market for the milk produced in the county which is aimed at improving the milk prices offered to the farmers. In addition to providing a better market for raw milk,

the processing plant will add value to the milk for such outputs as yoghurts and mala. This requires uptake of production by more farmers which will result to more opportunities for inputs such as fodder, Artificial Insemmination and Extension services.

Production: Dairy production in Kakamega County was low mainly due to overreliance on the indigenous cattle whose milk production was low and use of traditional feeding system. According to the Kakamega Dairy and Livestock status report of 2014, the county has an annual milk requirement of 197.6 million litres against the current production of 112 million litres. The level of dairy commercialization was low also due to limitations of land size (Average size of land was found to be about 1.5 acres), lack of information on dairy management and high costs of feeds. Due to the high cost of feeds, farmers grazed the indigenous cattle freely- where animals were feed on Napier grass, green maize stalks, Rhode's grass and some fodder trees - and farmers only supplemented these feeds with commercial feeds for the cows producing milk.

Aggregation: Dairy aggregation is done mainly by dairy farmers' cooperatives. The farmers deliver their milk to designated collection points from where the cooperatives bulked for delivery to the cooperative's chilling centres. As per Kenya Dairy Board (KDB[6]) records, Kakamega County has 13 dairy operational cooperatives. It was found that youth representation in these cooperatives is low (about 20 percent) due to limited involved on youth in dairy production. Besides, management of cooperatives is mainly done on voluntary basis and youth were not willing to engage in non-paying tasks. It was also found that farmers/ producers delivered milk as individuals to the collection centres owned by the cooperatives. It was noted that prior to receiving the milk at the collection centre, it is tested for adulteration using a lactometer and mastitis. To reduce milk rejection the cooperatives continuously train farmers on milk handling and testing.

The aggregator's major role in the value chain was to market the milk on behalf of the farmers in order to obtain the best prices (Cooperatives sold milk at an average price of K Sh 28–35 per litre depending on the season and paid farmers an average of K Sh 25–33 per litre) while ensuring prompt and consistent payments. The main markets for the milk from cooperatives were processors such as Brookside Dairy, New KCC Ltd in addition to institutions, dispensaries and milk traders.

Some of the challenges that aggregators faced included: Lack of reliable supplies from farmers and quantities supplied fluctuated; Lack of reliable buyers, consistent prompt payments is the key determinant for selecting a buyer; motor cycle accidents were reported to lead to milk losses and poor road networks were hindering to access more farmers.

Processing: This VC node was yet to be fully exploited. As noted during the study, there is no milk processing plant in Kakamega County though the county government had begun establishing one. Low milk supply in the county was the major challenge in venturing into milk processing. However, most of the dairy cooperatives in the county were involved in milk chilling prior to delivery of the milk to processors. There also existed some private firms that were involved in milk processing and value addition to produce yoghurt and mala such as Hilltop Dairy Farm, located in Eregi, Ikolomani Sub County. However, due to the low milk supply, sale of yoghurts and mala was minimal. For example, it was noted that due to low milk supply, Kakamega County was a net importer of milk from neighbouring counties such as Nandi.

Distribution: Distribution and marketing of milk in the county followed a number of channels as follows.

- **Farmers to cooperative societies to processors/consumers:** Farmers delivered their milk to collection centres owned by the cooperatives and upon receipt of milk, the cooperative societies chilled the milk and then sold to processors such as Brookside Dairy and New KCC, who are based outside the county but operate nationally, in addition to selling directly to institutions such as schools, hospitals and hotels. The bulk of the milk was sold to processors who paid prices in the range of K Sh 28 to 35

[6] https://www.kdb.go.ke/milk–producers–groups

per litre depending on the season and quantities supplied. From this price the farmers were paid an average of K Sh 25–33 per litre. It was noted that prices obtained from selling to other buyers (traders, schools, hospitals and hotels) ranged between K Sh 55–60 per litre depending on the quantities purchased. The main reasons farmers sold to processors was due to the guaranteed market for milk produced.

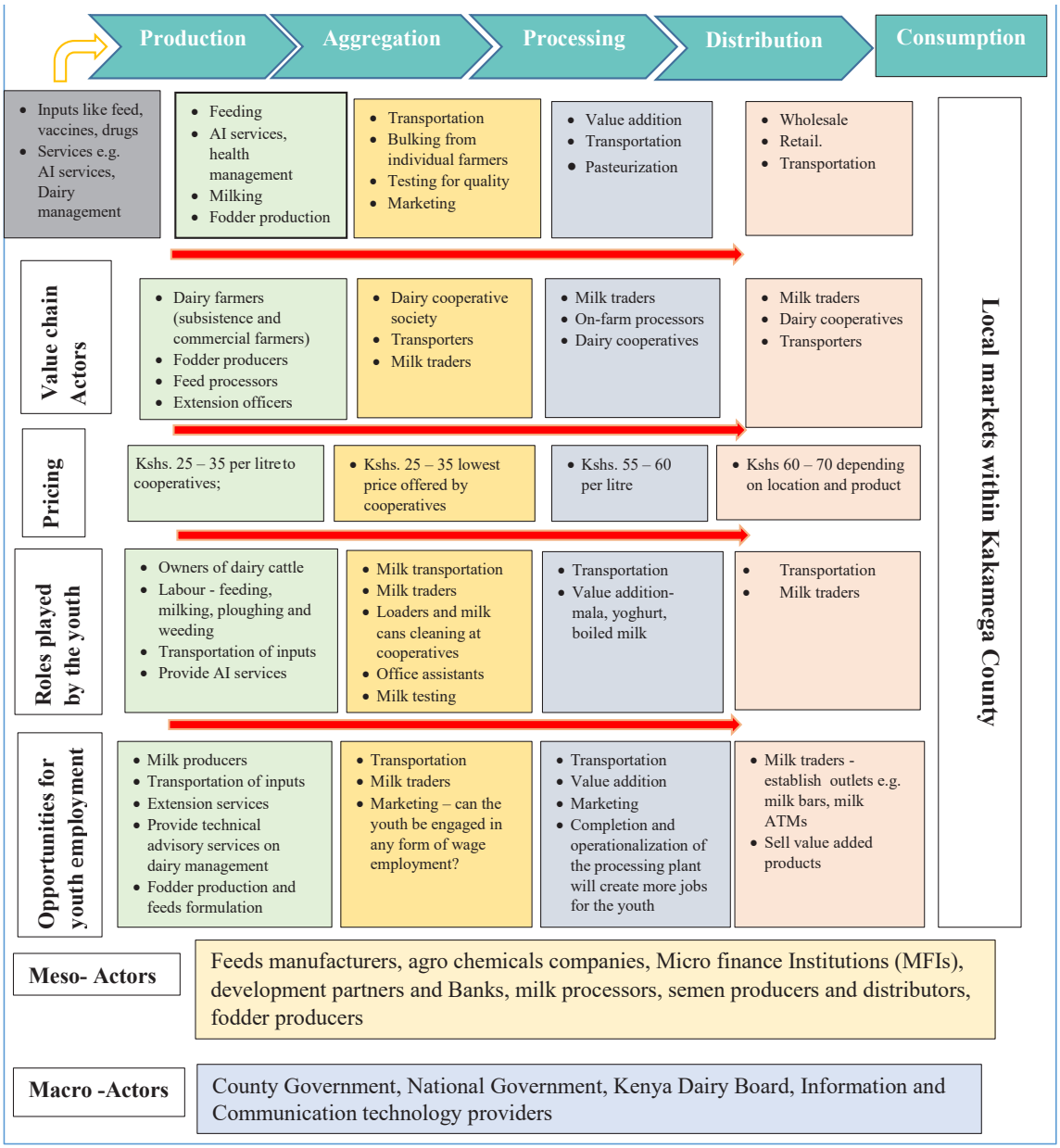
- **Farmers to consumers:** This was the most preferred distribution channel where the farmer sold directly to the end consumers. The consumers who were usually neighbors collected the milk from the farmers. They bought the milk at the prevailing market prices of between K Sh.60–70/= per litre of milk. However, selling directly to consumers had its challenges since the quantities sold was often small and buyers did not pay on time.
- **Farmers to milk traders to cooperatives/consumers:** The traders mainly bought from farmers for onward selling to cooperatives and consumers. The milk traders purchased from farmers at a low price in the range of K Sh 23–26 per litre and paid for the milk in cash which was an incentive to farmers who needed money for subsistence use. Traders sold to cooperatives at an average of K Sh 25–35 per litre depending on the time of the season and to consumers in the range of K Sh 50–60 per litre depending on their location and season. The traders sold to the consumers through their outlets such as milk automatic vending machines (ATMs), market stalls and door – to door sales. Some traders sold the milk processed through their milk bars and eateries as boiled milk, yoghurt or "mala'. The consumers bought the milk at a price of K Sh. 60 to K Sh. 70 per litre.

The main mode of transport used in distribution was motorcycles and male youth dominated this distribution node as motor cycle riders. The transport services were mainly provide by individual youth who either owned or leased the motorcycles. Transportation services were charged per trip based on the distance covered and the engagement was based on a negotiation on an adhoc basis.

Distribution challenges: some of the challenges cited include low milk prices due to exploitation by middlemen, traders and processors and sometimes lack of market information, "there is information asymmetry challenge whereby you find that in some instances there are areas with deficit supply of milk while other areas in the county have surplus yet farmers and value chain actors do not have this information" sub-county Livestock Officer, Shinyalu.

iii) Dairy value chain map

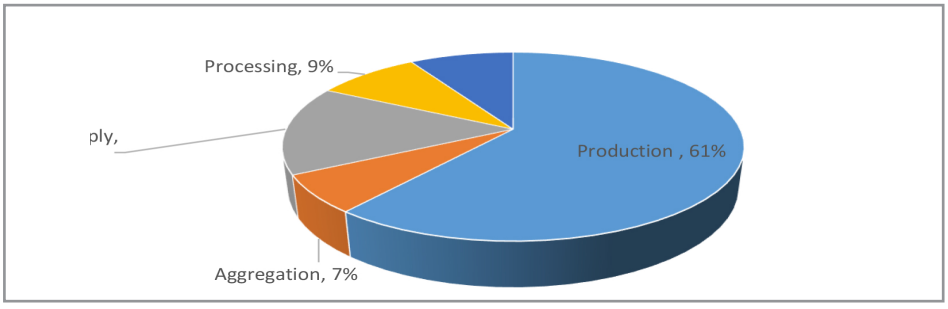
Figure 4. Dairy value chain map for Kakamega County



i) Description of youth current engagement in the core value chain

The study revealed that 42 percent (n=46) of the youth were engaged in the dairy value chain. On the type of engagement, 61 percent were engaged in production, 7 percent in aggregation, 9 percent in processing and 18 percent in distribution.

Figure 5. Type of youth engagement in the dairy VC in Kakamega County



It was established that 47.9 percent of youth were engaged in the dairy VC as individual agripreneurs mainly in informal businesses, while 52.1 percent contributed as family workers, casual workers, and permanent employees/wage workers or as seasonal/part-timeemployees. In addition, it was noted that from amongst youth agripreneurs in the dairy VC, 81.8 percent were male and 18.2 percent were female as presented in the table below.

Table 12. Youth engagement in the dairy value chain by employment status

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	18	81.8%	4	18.2%	22	47.9%
Casual worker[7]	–	–	–	–	24	52.1%
Contributing family worker	–	–	–	–		
Permanent employee/wage worker	–	–	–	–		
Seasonal/part-timeemployee/wage worker	–	–	–	–		
Total	–	–	–	–	**46**	**100%**

The findings revealed that 73.9 percent of youth actors in the dairy VC were male and 26.1 percent were female and of these actors, 4.4 percent were in the age bracket of 18–25 years, 30.5 percent (26–30 years) and 65.2 percent were in the age bracket of 31–35 years. In the sample, young men outnumber young women in all nodes, with young women more present in the production node compared to other nodes.

Table 13. Sex and age of dairy VC actors in Kakamega County

Type of Engagement	Gender		Total	Age (Years)								
				16–17		18–25		26–30		31–35		
	M	F		M	F	M	F	M	F	M	F	
Production	20	8	28		–	–	–	–	6	4	14	4
Aggregation	2	1	3		–	–	–	–	–	–	2	1
Input Supply	5	2	7		–	–	–	–	–	1	5	1
Processimg	4	0	4		–	–	–	–	3	–	1	–
Distribution	3	1	4		0	0	1	1	–	–	2	–
Total	**34**	**12**	**46**		**0**	**0**	**1**	**1**	**9**	**5**	**24**	**6**
Percentage	**73.9%**	**26.1%**	**100%**		**0%**	**0%**	**2.2%**	**2.2%**	**19.6%**	**10.9%**	**52.2%**	**13.0%**

With regard to weekly incomes, it was established that 18 percent (n=22) of the youth agripreneurs in the dairy VC earned a weekly income of up to K Sh.1 000, 18 percent a weekly income of between K Sh. 1 001 to 2 000, 32 pecent earned a weekly income of K Sh. 2 001–3 000, 23 percent earned K Sh. 4 001–5 000 and 9 percent earned K Sh. 5 001–10 000 per week.

Table 14. Average weekly income for dairy value chain actors

Dairy VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001 – 2 000	2 001– 3 000	3 001 – 4 000	4 001 – 5 000	5 001 – 10 000	Over 10 000	Total
Agripreneur	4	4	7	–	5	2	–	**22**
TOTAL	**4**	**4**	**7**	**–**	**5**	**2**	**–**	**22**
Percentage (%)	**18%**	**18%**	**32%**	**0%**	**23%**	**9%**	**0%**	**100%**

[7] Disaggregated data for contributing family workers, permanent employees and seasonal/part-timeworkers was not available.

On education attainment of VC actors, 14.29 percent of producers had achieved primary school education, 21.43 percent secondary education, 14.28 percent had post-secondary education and 50.0 percent had achieved college or university level education. All aggregators (100 percent) had achieved post-secondary education and all processors (100 percent) had achieved a minimum of college education. For distributors, 50 percent had achieved secondary level education, 50 percent had attained post-secondary education.

Table 14. Education attainment of dairy value chain actors in Kakamega County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer	14.29%	21.43%	14.28%	50.00%	100%
Aggregator	–	–	100.00%	–	100%
Processor	–	–	–	100.00%	100%
Distributor	–	50.00%	–	50.00%	100%

a) **Youth current engagement in the production node**

Type of engagement: This study found that 61 percent of the youth are engaged in the production node of the VC. Youth were engaged in rearing dairy cattle and fodder production. They did this as individual agripreneurs mainly as informal business owners. Average land size for fodder production is 1 acre which is mainly leased, while very few youth havebeen given land by their parents. "A number of youths have taken up fodder production especially in Lugari, Likuyani and Ikolomani Sub-counties," Sub-county Agriculture Officer (SCAO), Ikolomani.

Level of engagement: 80 percent of the youth interviewed engaged in production as owners, while 20 percent were employed mainly as casual workers while others were engaged as contributing family workers. Young men are usually engaged in manual labour like milking and feeding cows, sourcing for fodder and in animal disease management while young women were engaged in tasks such as cleaning milk cans, milking cows, feeding the cows and in disease management.

Table 15. Key tasks of young men and women in dairy production in Kakamega County

Value chain node	Male tasks	Female tasks
Production	• Feeding the animals, • Milking and cleaning the cows • Feeds production and formulation • Disinfecting the structure.	• Feeding and milking cows • Feeds production and formulation • Disinfecting, deworming the animals • Cleaning of the structure

Youth challenges in production: Youth both male and female, face a number of challenges in the production node.

- Negative attitude towards farming: "Youth tend to look down on farming as a source of employement and therefore they miss out on opportunities available in dairy production" - sub-county Agriculture Officer (SCAO), Shinyalu, Kakamega County.
- Due to limited access to land, few youths could engage in dairy production.
- Limited access to capital to purchase dairy animals.
- Lack of information on existence of opportunities and how they can be tapped in dairy production.

- Limited technical knowledge and information on animal breeding practices.

Youth opportunities in dairy production:

- **Fodder production and conservation:** Fodder production was prioritized by stakeholders as the most viable opportunity for youth engagement in the dairy value chains. There is great opportunity for business and employment in fodder production and conservation. There are good examples of youth who have excelled in this area especially in Lugari, Ikolomani and Likuyani Sub-county, for example Matende Farm in Lugari is run and managed by youth and Crescendo Youth group in Ikolomani specialize in fodder production as individuals. For example, gross margin analysis for production of Bhoma Rhodes in one acre of land, for two seasons per year provided net profit margins of K Sh 73 760 per year while net profit margins from production of napier grass in one acre per year provided was K Sh 33 705.[8]

- **Provision of extension services**: youth can be trained in provision of artificial insemination (AI) to farmers in the dairy value chain. It was found that these services were in demand and the existing extension services provided by the County government were not adequate due to lack of adequate staff and resources. Youth trained on AI can act as agents for distribution of this service or as community-based extension staff to administer AI. On average cost of an AI jab is estimated at K Sh 1 000 with net returns after costs of K Sh 400 per jab. On the other hand, revenues from sale of AI doses and nitrogen is estimated at K Sh 12 000 for 35 doses of local semen and net of costs returns would be K Sh 4 000.[9]

- **Dairy production**: It was noted that Kakamega County was a net importer of milk and production levels were low compared to demand. The upcoming processing plant being established by the county government provided an assurance of a guaranteed market for milk. Youth engagement in dairy production especially intensive dairy production which did not require a lot of land can be recommended. This type of production can be done on a small plot of 0.125 acre of land and required an investment of about K Sh 150 000 to purchase an improved breed of dairy cow such as Friesian and to construct the cow shed. With one cow farmers can generate gross monthly returns of K Sh 15 000.[10]

b) Youth current engagement in the aggregation

Type of engagement: Only 7 percent of the youth are engaged in the aggregation node. The youth are mainly engaged in aggregation on behalf of cooperative societies since they are the riders of motorcycles and specifically the young men. Most cooperatives contracted youth to collect and transport milk from farmers to the milk collection centres.

Level of engagement: Most youth were engaged in aggregation as transporters and this consisted of mostly young men who were involved in milk delivery from farmers to collection centres. It was observed that a few young women had also ventured into transportation business and they owned or leased motorcycles to young men. It was found that a few youth were also employed by milk cooperatives where they provided services such as record keeping and milk quality testing.

Table 16. Key tasks of young men and women in dairy aggregation in Kakamega County

Value chain node	Male tasks	Female tasks
Aggregation	• Transportation • Milk delivery • Milk quality testing • Record keeping	• Cleaning of milk cans • Milk delivery - delivery of own produce to collection centres • Milk quality testing • Record keeping

[8] A gross margin analysis for feeds formulation is provided in the appendices.
[9] Gross margin analysis for AI are provided in the appendices.
[10] A gross margin analysis for dairy production is provide in the appendices.

Youth challenges in aggregation:

- Lack of adequate capital to buy milk in bulk from farmers and to establish cooling facilities for the milk before collection by processors.
- Price competition especially from milk imported from other counties such as Nandi.
- Milk losses during transportation due to poor road network and sometimes motorcycle accidents.
- Incidences of adulteration of milk by transporters and farmers.

Youth opportunities in the aggregation:

- **Establishment of cooperatives** by youth which would enable pooling of resources to enable buying of milk in bulk and also purchase or leasing of milk cooling facilities. This was identified by stakeholders as the most viable opportunity in this node.
- **Operation of milk dispensing machines or milk ATMs** in locations with high populations. This is business is quite lucrative and does not require heavy capital investment. For example, a milk ATM with capacity of chilling 200 litres per day will costs about K Sh 180 000. This machine is capable of generating gross margins of K Sh 133 000 per month if established in a good location.[11]

c) Youth current engagement in the processing node of the value chain

Type of engagement: This node was not yet fully exploited mainly due to low supply of milk to meet the current high demand for fresh milk. Only 9 percent of the youth were engaged in processing.

Level of engagement: It was found that some youth owned milk bars and food eateries where they sold chilled milk, processing of milk to yoghurt and mala was also done. Many of these businesses owned by youth were small-scale in nature with earnings ranging from K Sh 1 500–2 500 per week. Some youths were also employed in the milk bars and food eateries that carried out milk processing. These youth were mainly hired as casuals or on temporary contracts for an average of 12 months and they earned K Sh 200–300 per day or K Sh 1 200 – 1 800 per week without any other benefits. It was noted that the processors who engaged casuals usually trained the casuals on hygiene procedures required in milk handling. Based on the study findings, there was no reported cases of OSH.

Table 17. Key tasks of young men and women in dairy processing in Kakamega County

Value chain node	Male tasks	Female tasks
Aggregation	• Milk chilling • Milk boiling • Processing of milk yoghurt and mala	• Milk chilling • Milk boiling • Processing of milk yoghurt and mala

[11] Gross margins for milk ATM is presented in the appendices.

Youth challenges or limitations in dairy processing:

- Lack of adequate capital to buy milk farmers and to purchase equipment and tools required for processing.
- Limited employment opportunities in processing since there was no processing plant in Kakamega.

Youth opportunities in dairy processing:

- Kakamega County has invested K Sh 150 million for construction of a dairy processing plant in Malava Sub-county. This plant will be used to process milk, yoghurt and "mala' (fermented milk). It is anticipated that completion and operationalization of the dairy processing plant will create direct jobs for the youth in the plant and other indirect jobs such as in transportation of milk and milk products from the plant.
- **Establishment of small-scale businesses** involved in value addition of milk into yoghurt and mala.

d) Youth current engagement in the distribution node of the value chain

Type of engagement: This study found that 9 percent of the youth were engaged in the distribution node of the dairy VC in Kakamega. These youths provided transport services using motorcycles and they were also engaged as milk traders owning milk bars and selling at the market stalls.

Level of engagement: It was established that youth were mainly involved in dairy distribution as transporters of milk using motor cycles and this was dominated by male youth. These services were provided by individual youth who either owned or leased these motor cycles. The youth riders were paid based on the distance covered and the amount of milk transported. Both young men and women were also involved in milk hawking and operating milk bars mostly as self-employed entrepreneurs.

Table 18. Key tasks of young men and women in dairy distribution node in Kakamega County

Value chain node	Male tasks	Female tasks
Aggregation	• Milk delivery and transportation; • Milk hawking • Milk bars	• Milk delivery and transportation; • Milk hawking • Milk bars

It was noted that the riders who provided transportation services for cooperatives and milk bar owners were contracted for an average of three months and they earned an average of K Sh 1 500–2 500 per week based on the distances covered and the amount of milk they transported. It was noted that the riders wore protective clothing such as helmets and jackets. Employees hired in milk bars were employed on casual basis and earned daily incomes in the range of K Sh. 200–300 per day without any other benefits.

Youth challenges in dairy distribution:

- **Price competition** from fellow youth riders which affected the business profitability negatively.
- **Poor road network** which made it difficult to collect milk from farmers to milk collection centres especially during wet seasons; This also contributed to high cost of maintaining the motorcycles due to damages and fuel costs.

Youth opportunities in dairy distribution:

- **Provision of milk transportation services** to the farmers and to cooperatives who own milk collection centres.

- **Establishment of milk bars and milk ATMs**, which would focus on providing customers with clean and high-quality milk as opposed to milk currently hawked by traders.
- Since the youth are technologically savvy, they can establish **online marketing platforms** to facilitate areas with milk surplus identify areas with unmet demand and also provide market information.

e) Youth engagement in the extended dairy value chain

Provision of inputs: Youth engagement in the provision of inputs in the dairy VC was very limited. Indeed, less than 1 percent of youths contacted in this study were directly engaged in provision of inputs. However, a number of youths were employed in agrovet shops where these shops provided inputs to the dairy VCs such as animal feeds, vaccines and drugs. In addition, some youths were involved in production and supply of fodder for animals, while others were engaged by the county government and private agrovets in delivery of subsidized AI services to farmers.

Youth challenges in the extended dairy value chain:

- **Lack of land** to plant the fodder: land needed to plant fodder for commercial purposes shouldn't be less than an acre and this was a big challenge for most youth.
- **High costs of inputs**: the costs of inputs such as animal feeds, drugs and vaccines was high which made it difficult for youth to raise sufficient capital to establish inputs supplies business.

Youth opportunities in the extended dairy value chain:

- **Feed's formulation:** The youth can obtain training on feeds formulation and subsequently offer the training to farmers at a fee and also formulate feeds for sale to the farmers.
- **Lease of land and engaging in fodder production**: The demand for fodder in the county and beyond is very high and youth can lease land and establish fodder production business.
- Youth with agricultural training can provide **extension and technical advisory services** at a fee to farmers.

f) Occupational safety and health issues in the dairy value chain

- In general terms, working in the dairy value chain can carry serious occupational risks. Dairy farmers have to work in close contact with animals, which results in both a high risk of accidents as well as a high risk of occupational diseases due to irritants of animal origins. Especially zoonoses. Activities considered more hazardous, especially for youth, include risk of accidents for young males engaged in distribution using motorcycles and drugs and vaccines contamination. However, no evidence of accidents related to humans was reported during our interviews and discussions.
- As regards the adoption of OSH measures, OSH measures reported to be adopted include: wearing protective gears (helmets and jackets) by the youth motorcycle riders, and dairy management trainings to ensure proper handling of drugs and vaccines.

2.2.4 Fish value chain

i) Current performance of Fish value chain

In Kakamega County, only 0.7 percent of households are engaged in fish farming. Fish farming is done in ponds (0.6 percent of the farming households) and in cages (0.1 percent of the farming households) as per KNBS, 2019. As per the County Integrated Development Plan (CIDP), 2018–2022, expansion of fish farming and operationalization of the fish processing plant are some of the county's Vision 2030 flagship projects. The county also plans to construct a fish feed factory and a warehouse at the processing plant. Currently, there are six private

hatcheries supplying male tilapia and catfish fingerlings. Whereas farmers had embraced commercial fish farming as alternative source of income, the supply of fish was still limited to sustain the operationalization of the fish processing factory.

ii) Brief description of the value chain structure

End market: According to the Kakamega County Chief Officer for Livestock and Fisheries, Dr Kelly Nelima the County produces 1 000 tonnes of fish annually but the production is low compared to the local demand with most of the fish consumed in Kakamega coming from Port Victoria in Busia County. The county was distributing fingerlings and fish feeds at subsidized prices so as to ensure more farmers venture into commercial fish production. Currently, the county had 2,300 registered fish farmers with a target to increase this number of the farmers to 5 000 by 2022 to be able to meet the local demand. It was also noted that Kakamega County required a minimum of 7 000 fish ponds to effectively serve the fish processing factory in the county which was capable of processing five tonnes of fish per day- Kakamega county Industrialization and Trade Executive, Kassim Were.

Currently the county sources juvenile fish from Nandi and fingerlings from Busia County since there is no fingerlings production centre in Kakamega County. There are a few farmers hatching fingerlings but they cannot satisfy the increased demand and the prices are very high for the farmers. A sizeable pond requires 1 000 tilapia fingerlings which currently costs K Sh. 10 per fingerling hence stocking one pond would require an investment at least K Sh. 10 000 above the construction and maintenance costs. The farmers are expected to earn K Sh. 250 000 from sale of the mature tilapia fish after 8 months. There is need to increase hatching of fingerlings to meet the current demand which will result to increase in uptake of fish farming. Demand for fish for local market consumption is still high with low supply from the county and hence there are imports from neighbouring counties of Kisumu and Busia and even from China.

Production: Fish production in Kakamega County is low mainly due to limited water supply in most of the farms and limited land for construction of the fish ponds. Most of the farmers rely on natural water sources such rivers for fishing. The main fish species bred by farmers are mud fish, tilapia and catfish. On average the farmers harvest about 300 fish per 300m^2 pond size for every 6–8 months cycle. It was observed that there is a very high demand for fish in the County and due to the high cost of feeds, many farmers harvested early before the fish attained maximum market weight. This had resulted to low selling prices since weight and size were the main price determinants in the market. It was noted that the county government intervention to provide subsidized fish feeds and fingerlings had been a major boost to fish farming since commercial feeds and fingerlings were very expensive.

Challenges in fish production include:

- Post-harvest losses due to lack of storage services; the losses arise from rotten fish due to delayed sale. "We are forced to sell the fish at throw away prices sometimes to avoid fish going bad and to minimize our losses" - Marama Self Help Group (SHG).
- Limited access and high costs of fish feeds and fingerlings.
- Poor breeds of fingerlings: sometimes farmers buy fingerlings from fellow farmers which may be poor breeds that are not viable for the market due to low weight and extended maturity date which results to higher costs of feeds.
- Animal predators which eat the fish in the ponds leading to losses.
- High cost of harvesting: "to cushion our group from the high costs that come with fish harvesting, our members provide communal labour which is free" - Marama SHG.
- Floods resulting from heavy rains cause destruction of the ponds and loss of fish.
- Cases of fish theft were also reported especially from fish ponds.

Aggregation: Aggregation of fish is unstructured and most of the aggregators are the

middlemen and traders who collect the fish from the farmers. Farmers usually harvest on market days when the traders are ready and willing to buy the produce. The middlemen usually make prior arrangements with the farmers for the quantities required and the day to make fish collection.

Aggregator's main challenges:

- Lack of adequate fish sizes and species to satisfy market demand. Early harvesting resulted to few fish attaining table size weight of 300–600g especially for tilapia and catfish species.
- Competition from fish imports: It was found that imported fish especially from China sold at a much lower price than locally produced fish which created unfair competition for farmers and aggregators.
- Inadequate market information and the aggregators have not expanded their market reach to assess markets with better prices and with lesser competition.
- Lack of adequate cold storage facilities which limits their purchase power and also minimizes losses due to spoilage.

Processing: This VC node was not yet fully exploited. Currently, the primary processing activities undertaken in this value chain are scaling, dissecting fish to remove intestines, sun drying, deep frying and salting. This was mainly done by the farmers and the traders. It was also found that Kakamega County, in partnership with a private investor, had established a fish processing plant which had begun processing fish to fillets but the low supply of fish could not sustain the operations of this plant and its operations were closed.

Main challenges faced by processors:

- Lack of storage facilities: Farmers did not have access to storage facilities or refrigerators to preserve fish. The only refrigerators available were in the processing plant which was quite a distance from the farmers.
- Unreliable fish supplies: Fish supplied by farmers is not adequate to sustain continuous major processing.

Distribution: From our engagements, it was noted that distribution and marketing of fish is unstructured and the following are the current distribution channels used in the VC.

- **Farmers to middlemen**: Farmers enter into arrangements with middlemen, who were the main buyers of the fish produced. Middlemen engage with farmers before the fish is harvested. Upon harvest, the fish is sorted and graded for determination of purchase price and quantities to be purchased. The grading is mainly through observation and weighing with the hands. The middlemen buy fresh fish and table size fish (300–600 grams) at a purchase price in the range of K Sh. 150 to 250 per piece. The middlemen do not buy small fish (less than 300 grams).
- **Farmers to consumers**: upon harvest and sale to the middlemen and traders, the farmers are usually left with fish especially the small to medium sizes. The farmers alert their neighbors and friends for these fish and they sell these small size fish for prices ranging from K Sh 30 to 200 per fish depending on the sizes.
- **Farmers to traders**: farmers sometimes sell fish to retail traders who then sell the fish to consumers in the market or to hotels. The traders collect the fish from farmers and sort and grade this fish based on sizes. The purchase prices range between K Sh. 100 to 250 per Kg.

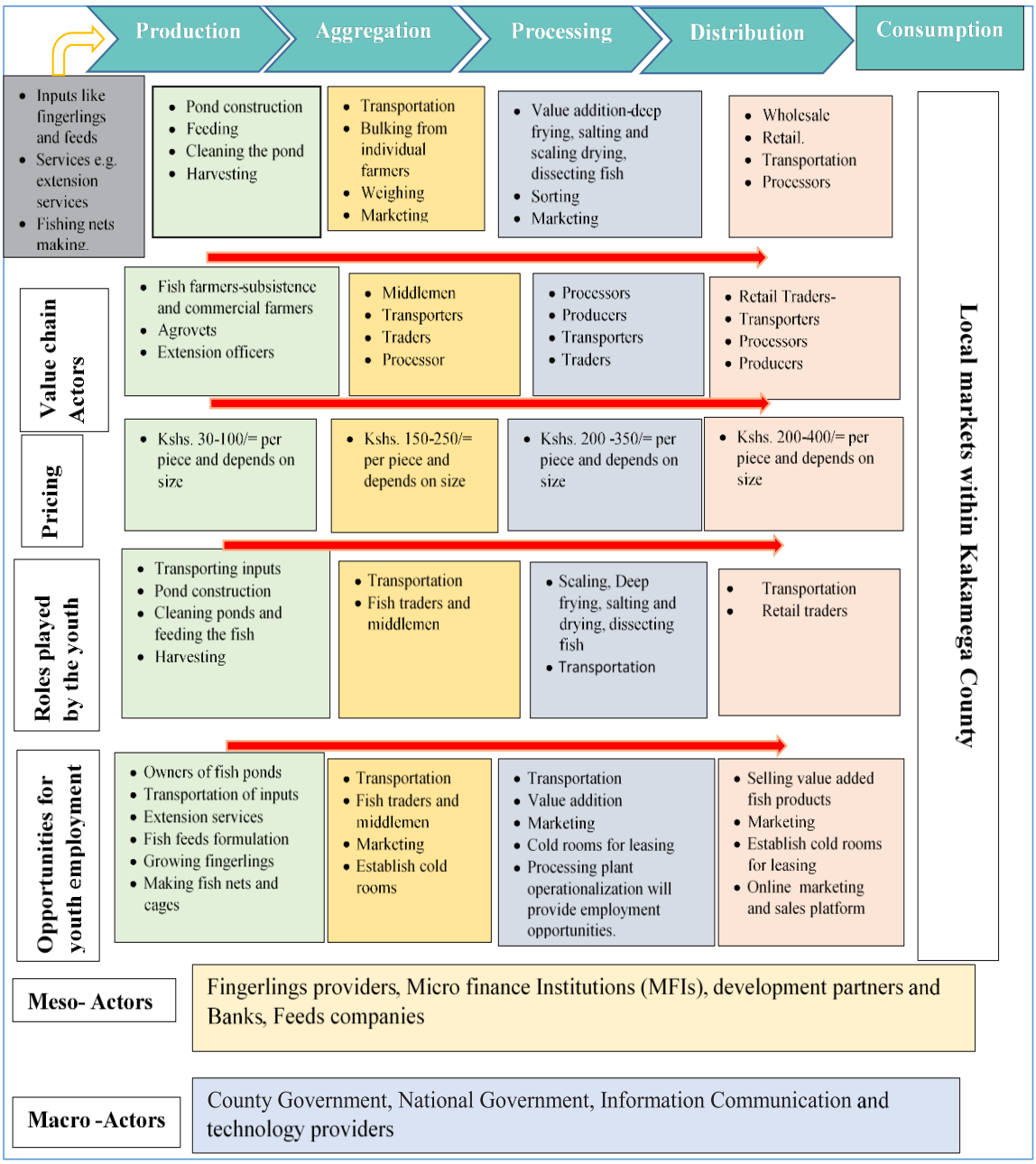
Distribution challenges:

- Low prices of fish due to competition from imported fish especially coming from China.

- Lack of weighing scales for better price determination since weighing is done manually and through observation.
- Lack of storage services resulting to losses occasioned by fish rotting.
- Non-payment of debts: buyers or consumers get fish on credit and do not pay their debts. This applied mainly for fish sold directly by farmers to neighbours and friends.
- Inadequate market information on available markets with better prices.

iii) Fish value chain map

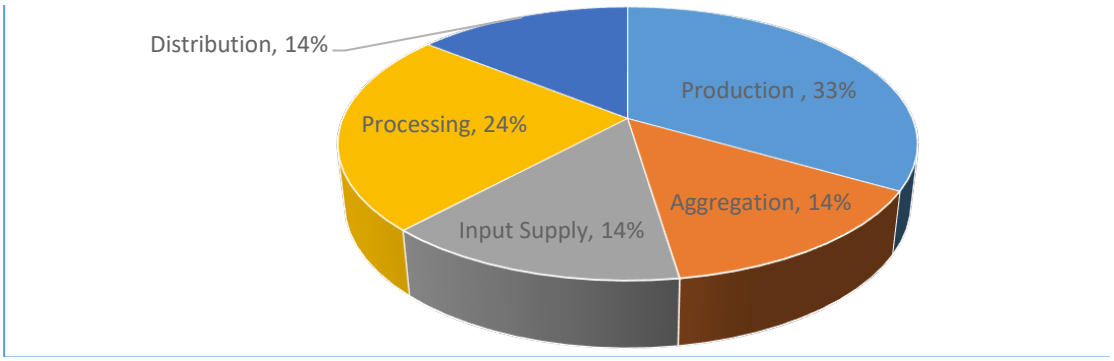
Figure 6. Fish value chain map for Kakamega County



iv) Description of youth current engagement in the fish value chain

The survey found that 15 percent (n=21) of youth interviewed for this study were involved in the fish value chain, and more specifically 33 percent were in production, 14 percent in aggregation, 24 percent in processing, 14 percent in distribution, and 14 percent were involved in input supply.

Figure 7. Type of youth engagement in the fish VC in Kakamega County



The study found that 33.3 percent of the youth in the fish VC were engaged as agripreneurs (both formal and informal businesses), 4.8 percent as permanent employee/wage worker and 4.8 percent ad seasonal/part-timeworker, while 57.1 percent were engaged either as causal workers or contributing family workers. With reference to the type of work engagement, young men seem to be more represented among agripreneurs at 57.1 percent compared to young women at 42 percent as presented in the table below.

Table 19. Youth engaged in the fish VC by type of employment

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	4	57.1%	3	42.9%	7	33.3%
Permanent employee/wage worker	1	100%	0	100%	1	4.8%
Seasonal/part-timeemployee/ wage worker	0	0%	1	100%	1	4.8%
Casual workers and contributing family workers[12]	–	–	–	–	11	57.1%
Total	**–**	**–**	**–**	**–**	**21**	**100%**

The findings revealed that 57.1 percent of youth actors in the fish VC were male and 42.9 percent were female and of these actors, 14.3 percent were in the age bracket of (18–25 years), 28.6 percent were in the age bracket of (26–30 years) and 57.1 percent were in the age bracket of 31–35 years. As per the sample of this study, young men outnumbered women in the production and input supply node of the value chain, while young women were more represented in the processing node. Shares were more balanced for the other nodes.

[12] Disaggregated data for casual workers and contributing family workers was not available.

Table 20. Sex and age of fish VC actors in Kakamega County

Type of Engagement	Gender			Age (Years)							
	Male (M)	Female (F)	Total	16–17		18–25		26–30		31–35	
				M	F	M	F	M	F	M	F
Production	6	1	7	–	–	2	–	4	–	–	1
Aggregation	1	2	3	–	–	–	–	–	–	1	2
Input Supply	3	0	3	–	–	–	–	–	–	3	–
Processimg	1	4	5	–	–	–	1	1	1	–	2
Distribution	1	2	3	–	–	–	–	–	–	1	2
Total	**12**	**9**	**21**	**0**	**0**	**2**	**1**	**5**	**1**	**5**	**7**
Percentage	**57.1%**	**42.9%**	**100%**	**0%**	**0%**	**9.5%**	**4.8%**	**23.8%**	**4.8%**	**23.8%**	**33.3%**

With regard to weekly incomes, it was established that 33 percent of the youth earned a weekly income of up to K Sh.1 000, 22 percent a weekly income of between K Sh. 1 001 to 2 000 and 44 percent earned an income of K Sh.3 001 to 4 000 per week.

Table 21. Average weekly income for fish value chain actors

Fish VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001– 2 000	2 001– 3 000	3 001– 4 000	4 001 – 5 000	5 001– 10 000	Over 10 000	Total
Agripreneur	2	2	–	3	–	–	–	**7**
Permanent Employee	1	–	–	–	–	–	–	**1**
Seasonal/Parttime/Wage worker	–	–	–	1	–	–	–	**1**
TOTAL	**3**	**2**	–	**4**	–	–	–	**9**
Percentage (%)	**33%**	**22%**	**0%**	**44%**	**0%**	**0%**	**0%**	**100%**

On education attainment of VC actors, 60 percent of producers had achieved secondary school education, 20 percent had post-secondary education and 20 percent had achieved college or university level education. All processors (100 percent) had achieved a minimum of college education. For distributors, 30 percent had achieved secondary level education, 14.5 percent had achieved post-secondary education and 55.5 percent had accomplished college or university level education.

Table 21. Education attainment of youth actors in the fish value chain in Kakamega County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer	–	60.00%	20.00%	20.00%	100%
Aggregator	–	–	–	0.00%	100%
Processor	–	–	–	100.00%	100%
Distributor	–	00.00%	0.00%	0.00%	100%

a) Youth current engagement in the production

Type of engagement: It was found that 33 percent of the youth engaged in the fish VC in the county were involved in fish production. Youth were engaged in the production of fish in family-owned fish ponds owners and as employees of fish pond owners and no fish cage farming was practiced in Kakamega County.

Level of engagement: 75.6 percent of the youth were engaged in production as agripreneurs while 24.4 percent were employed. Youth were engaged in fish production as individuals or as hired casual workers who were paid daily wages in the range of K Sh 150–300 per day with no additional benefits provided. These employees also worked without contracts. Regarding key tasks performed, young men were mainly engaged in fish feeding, procuring feeds, fish harvesting, sorting and grading and removal of scales and intestines while young women were involved in fish feeding, cleaning of fish after harvest, sorting and grading and removal of scales and intestines.

Table 22. Key tasks of young men and women in fish production in Kakamega County

Value chain node	Male tasks	Female tasks
Production	• Fish feeding • Procuring feeds • Fish harvesting • Sorting and grading • Removal of scales and intestines	• Fish feeding • Sorting and cleaning fish after harvest • Sorting and grading • Removal of scales and intestines

Youth challenges in production:

- Lack of land for establishing fish ponds;
- Limited water supply for use in fish ponds.

Opportunities that the youth can leverage on:

- Youth can lease land for establishment of fish ponds. To establish a fish pond of 300 m^2 would cost approximately K Sh 60 000 and the returns of fish pond farming for eight months are about K Sh 129 500.[13]

- Extension services to fish farmers are limited and youth with technical knowledge on fisheries can provide extension services at a fee. For example, for farmers interested in establishment of fish ponds youth can provide labour and expertise in this construction which is estimated at K Sh 200 per m^2.

b) Youth current engagement in the aggregation

Type of engagement: Very few youth, 14 percent (n=3) were involved in aggregation of fish in the county. In this node, youth provide aggregation services as transporters and this was mainly done by young men. Some youth also provided cold storage facilities such as refrigeration of fish after it is harvested and prior to collection of the fish by traders.

Level of engagement: It was noted that over 95 percent of the youth engaged in aggregation were in self-employmentand only 5 percent were employed. Key tasks performed by the young men and women were transportation, provision of cold storage of fish after harvest. The cold storage was in form of cooler boxes with ice cubes. Fish transporters were paid based on the number of fish transported and the distance covered, while fish storage in the deep freezer was charged based on the size of fish and it range from K Sh 10–20 per piece. On average, fish aggregators earned income in the range of K Sh 1 800–3 000 per week. For employees in this value chain node, terms of employment were mainly on casual terms and daily wages ranged K Sh 150–300 per day with no additional benefits.

Table 23. Key tasks of young men and women in fish aggregation in Kakamega County

Value chain node	Male tasks	Female tasks
Aggregation	• Fish transportation • Fish storage	• Fish transportation • Fish storage

[13] Gross margin analysis for fish pond is provided in the appendices.

Youth challenges in fish aggregation:

- Lack of adequate capital to buy fish in bulk from farmers.
- Inadequate refrigeration facilities for harvested fish.
- Price competition especially from fish imported from other countries such as China.

Youth opportunities in fish aggregation:

- Establishment of fish aggregation cooperatives. Youth can establish aggregator cooperatives which can buy fish from farmers and store the fish in fish freezer boxes prior to delivery of the fish to traders or to hotels and restaurants. For example, on average fish is purchased at K Sh 250 per pierce (Table size) and this same fish can be sold to hotels and restaurants at K Sh 300 per pierce, while in the market it can fetch K Sh 400. With a capital of K Sh 150 000 a youth group can acquire a 350 litres deep freezer for K Sh 60 000 and use the balance as working capital to buy fish from farmers. This business can generate gross returns of K Sh 10 000 weekly. This business opportunity was identified by stakeholders as the most viable in the fish value chain in Kakamega County.

c) Youth current engagement in the processing

Type of engagement: The study found that out that 24 percent (n=5) were engaged in fish processing. Processing methods used included: Deep frying, salting and drying and dissecting fish.

Level of engagement: It was observed that 85 percent of the youth were engaged as agripreneurs as individuals, while 15 percent were employed on casual terms and had no formal contracts of employment. Young women were the dominant players in fish processing and they were mainly involved in deep frying, salting and drying as well as dissecting fish. These tasks were also performed by young men although on a very limited scale. Employees in this VC node worked as casuals and were paid based on the number of fish processed. On average workers earned K Sh 150–250 per day without any other benefit. It was also noted that youth engaged in processing the fish were trained by their employers, peers and parents on fish processing and handling procedures and that there were no notable work-related hazards or accidents.

Table 24. Key tasks of young men and women in fish processing in Kakamega County

Value chain node	Male tasks	Female tasks
Processing	• Salting and drying and dissecting fish	• Deep frying • Salting and drying and dissecting fish

Youth challenges in processing:

- Lack of adequate knowledge and information on fish processing beyond basic processing currently done.

Youth opportunities in processing

- Youth can engage in fish value addition such as making fish samosas, fish fillet and fish fingers and cooking fried fish. These businesses have the capacity to generate an average of K Sh 150–450 per day for youth.[14] Youth can also leverage on online marketing platforms for marketing of these value-added products.
- Kakamega County has plans to reopen the fish processing plant and this would provide employment opportunities to the youth.

[14] Gross margin analysis for fish value addition is presented in the appendices.

d) Youth current engagement in the distribution node of the value chain

Type of engagement: It was found that 14 percent of youth were engaged in distribution activities. Youth mainly provided distribution services using motorcycles and pick-ups, while those engaged in trading were involved in selling fish in the local market and acting as middlemen in the VC. Youth traders bought fish from local farmers or from neighboring counties such as Vihiga County. It was found that distribution of fish was mainly dominated by young men while trading of fish was dominated by young women.

Level of engagement: The youths engaged in distribution are paid as per distance travelled during transportation. The youths engaged in distribution either owned or leased the motor cycles. The youth earned gross earnings in the range of K Sh 1 600–3 000 per week based on the number of trips made and number of fish sold. It was observed that the motor cycle riders wore protective gear when riding motorcycles. Youth engaged in trading activities were either employed or engaged in agripreneurship. Those employed in the trading node worked as casuals and were paid based on the number of fish sold and earnings ranged K Sh 150–300 per day with no other benefits. Youth carrying out business earned gross margins in the range of K Sh 500–1 000 per day based on the number of fish sold.

Youth challenges in distribution:

- Low prices of fish due to competition from imported fish especially coming from China.
- Lack of weighing scales for better price determination since weighing is done manually and through observation.
- Lack of storage services resulting to losses occasioned by fish rotting.
- Non-payment of debts - this is mainly for fish sold directly by traders to consumers and friends on credit terMs
- Inadequate market information on available markets with better prices.

Youth opportunities in distribution

- Provide transportation services with cooler boxes for better service and quality assurance.
- Develop online marketing platforms to facilitate sales and purchase of fish products.

e) Youth engagement in the extended value chain

Provision of inputs: the main inputs used in the production of fish are fingerlings and fish feeds. It was found that youth were mainly involved in transportation of inputs from the suppliers to the farmers using motor cycles. This activity was predominantly carried out by young men. It was also established that youth were involved in weaving of fishing nets and making/repairing of fishing boats.

Youth challenges in the extended value chain:

- High costs and non-availability of the inputs - fingerlings and fish feeds.
- Getting the best breed of fingerlings is difficult since the existing few hatcheries were prioritizing the county's initiative of giving free fingerlings to farmers.

Youth opportunities in the extended value chain:

- Youth can establish feeds formulation enterprises to deliver fish feeds to farmers. For example, using locally available ingredients such as vegetable waste, grain chaff and powder made from small fish which are rich in protein and energy needed for fish

growth. Feeds formulated at farm level can be sold at K Sh 150/Kg generating and can be packaged in 5, 10 or 20 Kgs bags for sale to fish farmers.

Other VC specific services: Other VC specific services include extension services and technical advisory services in fish farming. It was noted that there were very few extension officers, who were not able to visit and support all fish farmers and this provided an opportunity for youth especially those with a technical background in fisheries to provide extension services and technical advisory services to farmers at a fee.

f) Occupational safety and health issues in the fish value chain

- In general terms, working in fish farming can carry serious occupational risks, due to physical (ex. injuries due to falls, sting from fish spines or even snake bites), chemical (ex. due to water pollution or contamination), and biological (ex. due to parasites in the ponds) hazards. Activities considered more hazardous, especially for youth include risk of accidents for young males engaged in distribution using motorcycles, entry into the ponds during cleaning.
- No major accidents were reported during interviews and discussions with VC actors.
- As regards the evidence of adoption of OSH measures, OSH measures adopted included; wearing protective gears (helmets and jackets) by the youth motorcycle riders, pond management trainings to ensure proper construction of the ponds with clear entries, proper cleaning of ponds and clearing of bushes to keep away rodents which are harmful to humans too.

2.2.5 Soya value chain

i) Current performance of Soya VC

Kakamega County is the leading soya bean producing region in Kenya (Syngenta, 2016). A number of farmers in Kakamega County have embraced soya bean farming for commercial purposes especially those in Khwisero sub-county. These farmers were previously doing subsistence farming. Training by NGOs such as Sustainable Organic Farming Development Initiative (SOFDI) and Anglican Development Services (ADS), Grain Growers Association as well as Kenya Agricultural and Livestock Research Organisation (KARLO) had informed farmers on the nutritional and economic benefits that could be derived from soya beans farming. Due to the increased production of soya beans after the training and mobilization of farmers, a soya processing plant owned by Kwisero Lead Farmers Forum, was established in Khwisero at the sub-county Government's incubation centre.

ii) Brief description of the value chain structure

End market: Soybean provides a cheap alternative to animal proteins, making it effective in addressing challenges of food insecurity. Projections by the Consultative Group for International Agricultural research (CGIAR) indicate an upward trend in soybean demand arising from the need for cheap protein and vegetable oil as well as increased population (CGIAR, 2016). The bulk of industrial soybean usage is in the manufacturing of animal feed (Abate *et al.* 2011). This demand is expected to continue to grow following increasing demand for meat and meat products in sub-Saharan Africa. Additionally, international regulations such as the European Good Agricultural Practices (EuroGAP) require that meat exports to the European Union should not have been fed animal fat or protein (Chianu *et al.* 2008). Soybean is also processed into soybean oil, which is popular because it is cholesterol free. Other products from soybean are soymilk, soy yogurt, snacks, soya sauce, protein extract and concentrates for human consumption.

Kenya domestic consumption of soybean is 150 000 tonnes a year (Syngenta 2016), whereas local production ranges from 1500 to 3 000 tonnes annually (FAOSTAT 2019). This means that the country continues to spend large amounts of foreign earnings on soybean imports to supplement local production. In 2018, Kenya imported 68 000 tonnes of soy meal, this figure having tripled in 10 years (Index Mundi 2019). Kakamega County through development

partners such as ADS and SOFDI among others have sensitized farmers on the nutritional benefits and opportunities of Soybean farming, provided training in soybean farming whilst providing them with certified seeds and fertilizers as seed capital and at subsidized prices. The result of these initiatives has been an increase in Soybean production. There is still need to increase the production since the demand is quite high with an estimated 98 percent of the current production being sold to industrial processors in food and animal feed and human food. These processors include the Lead Farmers processing plant in Khwisero, Kakamega County and external processors such as Unga feeds, BIDCO, Promasidor and Proctor & Allan. In addition to the processors, there is local market for the raw seeds and the value-added products such as Soybean oil, soya nuts, yoghurt, milk and mandazis.

Production: Several farmers in Kakamega County mostly in Khwisero sub-county had embraced Soya beans farming for commercial purposes. Upon receiving training from SOFDI, some farmers had been contracted to carry out seed multiplication and given certified seeds by KARLO. On harvesting, SOFDI purchased these seeds at K Sh. 100/Kg and later sold the seeds to other farmers. This had ensured that the farmers used certified seeds to ensure quality production and for higher yields.

It was noted that land used to produce soya beans was small to medium scale due to the limitations of land in the County. An acre of land had the capacity to produce 1 000–3 000 kilograms of soya beans. On harvesting, the soya beans were threshed and dried for selling. For better returns, the soya beans were sold immediately due to perishability since the farmers didn't have proper storage facilities for the soya beans and also the need for quick returns to sustain their livelihoods. Soya beans were also used for feed formulation though the weight was low hence returns were also low.

Aggregation: Aggregation of soya was well structured. The soya farmers had organized themselves in groups which were registered with the Community Based Organisation (CBO) - Kwisero Lead Farmers Forum, located in Khwisero Sub-county and which owned a processing plant. It was noted that about 10 percent of the member of the CBO were youth and the youth were also engaged as transporters of soya beans. On harvesting, farmers delivered their produce to the collection centers for weighing and recording. The collection centers bulked the produce and delivered to the factory. The processing factory was charged with identifying markets for the farmers' deliveries. In addition to collection centers delivering to the factory, they could also sell produce to feed companies. However, selling to the factory was preferred due to the opportunity of obtaining seeds on credit to be recovered from the next harvest. In addition, farmers were entitled to dividends at the end of the year as a result of the profits made by the factory. It was found that the biggest challenge facing aggregators was inadequate soya bean supplies.

Processing: Soya is harvested and taken to the factory for processing. However, only about 30–40 percent of soya is processed since the factory processed what remained after selling the soya harvest to feed companies. Products obtained from processing were soya yoghurt, soya milk, soya roasted nuts and soya beverage. The residual material from initial processing was used to bake "mandazis' and also sold as raw materials for animal feeds. The main challenge in processing was that the machines used were operated manually and only one individual was consistently available to operate the machine, which limited the capacity for mass production. However, there was potential for automation of the processing when electricity connection to the premises was in place.

It was also noted that some farmers were engaged in roasting soya for domestic consumption, while others roasted the soya beans as a snack as well as soya beverage for the local markets. However, it was also found that many farmers did not have knowledge and skills on how to roast soya in the right way and roasting the beans wrongly was hazardous and this therefore limited the roasting of the beans for domestic use only.

Distribution: Distribution and marketing of soya was semi-structured. The following are the current distribution channels in place:

- **Farmers to processing factory** - This was identified as the most preferred distribution channel due to the benefits associated with the channel. Farmers delivered to the

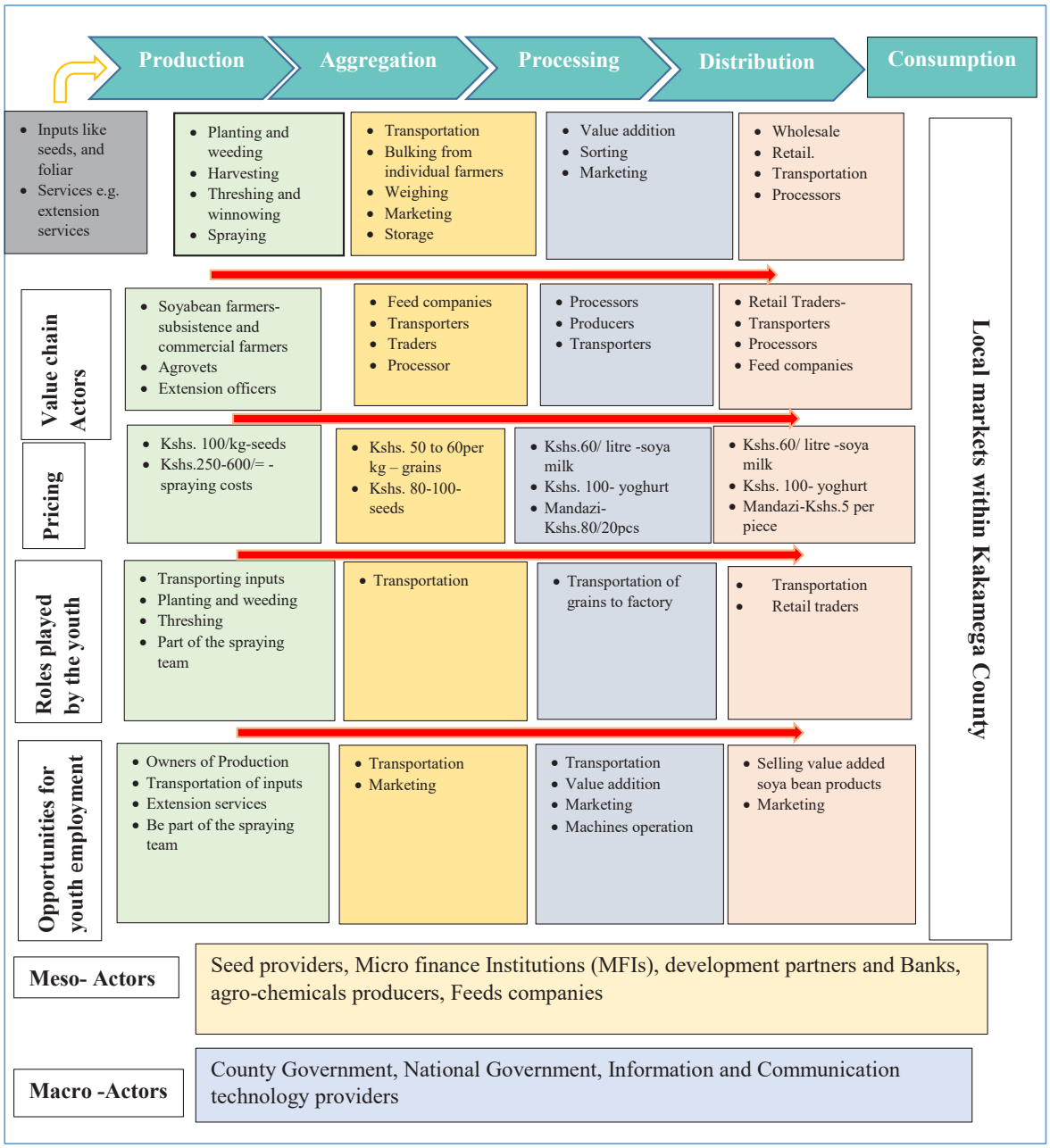
collection centres and then the produce was taken to the factory for processing. The factory identified markets for the produce which were mainly feed companies. In some instances feed companies go to the collection centres to directly buy from farmers. However, this was more of an exception since farmers do not sell all their produce to them. In addition, the factory also sold value added soya beans products such as soya milk, soya roasted nuts and soya beverage.

- **Farmers to feed companies** - Feed companies usually come to the collection centers seeking to buy the soya beans. The farmers usually sell part of their delivery to the feed companies for immediate cash and the rest to the factory.

The mode of transport used in distribution was motorcycles and pick-ups depending on the quantities. The youths, only young males, were the main providers of transport especially when using the motorcycles.

iii Soya value chain map

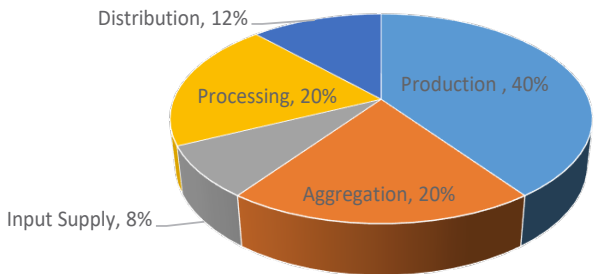
Figure 8. Soya value chain map, Kakamega County



iv) Description of youth current engagement in the core value chain

It was found that 20 percent (n=25) of youth interviewed were engaged in soya beans value chain, with 40 percent engaged in the production node, 20 percent in aggregation, 20 percent in processing and 12 percent in distribution and 8 percent in input supply.

Figure 9. Type of youth engagement in the soya beans VC in Kakamega County



The findings revealed that 28 percent of youth actors in the soya VC were engaged as agripreneurs, 4 percent were permanent employees and 68 percent were engaged either as seasonal/part-timeworkers, casual workers or contributing family workers. It was also noted that 57.1 percent of agripreneurs were male and 42.9 percent were female as presented in the table below.

Table 25. Youth engagement in the soya VC by type of employment

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	4	57.1%	3	42.9%	7	28%
Permanent employee/wage worker	1	100%	0	100%	1	4%
Seasonal/part–time employee/wage worker[15]	–	–	–	–	17	68%
Casual worker	–	–	–	–		
Contributing family worker	–	–	–	–		
Total	**–**	**–**	**–**	**–**	**25**	**100%**

The findings revealed that 64 percent of youth actors in the soya VC were male and 36 percent were female and of these actors, 4 percent were in the age bracket of 16–17 years, 16 percent were in the age bracket of 18–25 years, 24 percent (26–30 years) and 56 percent were in the age bracket of 31–35 years. Participation by VC node was rather balanced between genders, with a stronger difference only in the aggregation node, where young men outnumber women.

[15] Disaggregated data for seasona/part-time workers, casual workers and contributing family workers was not available.

Table 26. Sex and age of Soya VC actors in Kakamega County

Type of Engagement	Gender		Total	Age (Years)							
				16–17		18–25		26–30		31–35	
	M	F		M	F	F	M	F	M	F	
Production	6	4	10	–	–	1	1	1	2	4	1
Aggregation	4	1	5	1	–	–	–	–	–	3	1
Input Supply	1	1	2	–	–	–	–	–	–	1	1
Processing	3	2	5	–	–	1	–	–	1	2	1
Distribution	2	1	3	0	0	1	–	1	1	–	–
Total	**16**	**9**	**25**	**1**	**0**	**3**	**1**	**2**	**4**	**10**	**4**
Percentage	**64%**	**36%**	**100%**	**4%**	**0%**	**12%**	**4%**	**8%**	**16%**	**40%**	**16%**

With regard to weekly incomes, it was established that 25 percent (n=8) of the youth in soya VC earned a weekly income of up to K Sh.1 000, 12.5 percent a weekly income of between K Sh. 1 001 to 2 000, 12.5 percent a weekly income of between K Sh. 2 001 to 3 000, 25 percent earned an income of K Sh. 3 001 to 4 000 per week and 25 percent earned an income of K Sh. 4 001 to 5 000 per week.

Table 27. Average weekly income for soya value chain actors

Soya VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001–2 000	2 001–3 000	3 001–4 000	4 001 – 5 000	5 001–10 000	Over 10 000	Total
Agripreneur	2	1	1	2	1	–	–	**7**
Contributing Family worker	–	–	–	–	1	–	–	**1**
TOTAL	**2**	**1**	**1**	**2**	–	–	–	**8**
Percentage (%)	**25%**	**12.5%**	**12.5%**	**25%**	**25%**	**0%**	**0%**	**100%**

On education attainment of VC actors, it was found that 20 percent of producers had achieved secondary school education, 40 percent had post-secondary education and 40 percent had achieved college or university level education. All processors (100 percent) had achieved a minimum college or university level education. For distributors, 50 percent had achieved primary level education and 50 percent had post-secondary level education.

Table 28. Education attainment of actors in the soya beans VC in Kakamega County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer		20.00%	40.00%	40.00%	100%
Processor				100.00%	100%
Distributor	50.00%		50.00%		100%

a) Youth current engagement in the production node of the VC:

Type of engagement: This study found that 40 percent of youth in the VC were engaged in the production node. Youth were engaged in soya beans production in land preparation, planting, weeding and harvesting.

Level of engagement: From the findings, 80 percent of the youth were engaged in production on family-owned land as self-employed individuals while 20 percent were employed as wage earners or as contributing family workers. Majority of the employees were hired on casual basis to carrying out various tasks. Young men were mainly engaged in land preparation, ploughing, spraying of foliar, planting and harvesting of crop while young women were mainly involved in weeding, shelling, winnowing, grading and packing.

Table 29. Key tasks of young men and women in soya production in Kakamega County

Value chain node	Male tasks	Female tasks
Production	• Land preparation, ploughing and planting • Harvesting • Spraying of foliar	• Weeding - it is part of the local culture for women to be involved in weeding; • Shelling, winnowing grading and packing

Youths engaged in production earned incomes in the range of K Sh 1 800–3 000 per month as full-time employees while casual employees were paid an average of K Sh 150–300 per day and it was observed that there were no contracts for employment. However, since most hired workers lived on the farm, they were provided with accommodation and meals in addition to daily wages. It was also noted that occupational safety was observed with 84.2 percent of youth confirming that there were no reported OSH accidents and that foliar pumps were availed and the spraying teams had been trained and equipped with Personal Protective Equipment (PPEs) and clothing.

Youth challenges in production:

- The main challenge youth faced was lack of land for establishing soya beans production.
- Youth also faced distraction from alternative quick money-making businesses such as riding of motor cycles.

Youth opportunities in production:

- There is opportunity for leasing of land to establish soya beans production. Youth can lease land as a group and engage in soya production. It was found that obtaining land for leasing was not a challenge. On average youth can obtain gross margins of K Sh 56 700 per acre from soya production[16] per season which is about three months.
- Youth can provide value added services in production such as spraying of crop which does not require a huge investment but which can be a source of income;

b) Youth current engagement in the aggregation

This study found that 20 percent of the youth in the VC were engaged in the aggregation. These youth were mainly engaged in aggregation as transporters since they were the riders of motorcycles, especially young men.

Level of engagement: It was noted that aggregation node was mostly dominated by male youth who were contracted as transporters of harvested soya from farmers to collection centres within Khwisero Sub-county. The youth were also involved in weighing and recording of soya delivered. Most of these youth were self-employed and their pay was pegged on the amount of soya delivered in Kilograms and also the distances covered. On average transporters earned K Sh 300–500 per day depending on the number of trips and Kilograms delivered. However, since soya production is seasonal, the youth are only engaged when there was a harvest which was three times per year (2 short seasons of 3 months and 1 long season of 6 months).

Table 30. Key tasks of young men and women in soya beans aggregation in Kakamega County

Value chain node	Male tasks	Female tasks
Aggregation	• Soya transportation • Soya weighing and recording	• Soya weighing and recording

Youth challenges in aggregation:

- Competitive prices from other transporters.
- Poor road networks from farms to collection centers.

Youth opportunities in aggregation:

- The youths can be engaged in transportation. Opportunities exist for youth to engage in motor cycle business and to be contracted as transporters by soya aggregators. During off season, the youth motor cycle riders would be engaged in transportation business in other value chains in the County.
- They can source for additional markets to ensure the farmers get the best price for their produce and also make better profits.

c) Youth current engagement in the processing

Type of engagement: Only 20 percent of the youth in the VC were engaged in processing. Youth were mainly engaged in sorting and grading of soya beans for delivery to the collection centres and threshing and winnowing after harvesting.

Level of engagement: Most of the actors in this node were employed in the soya factory. Young men were mainly engaged in soya value addition and processing of animal feeds while young women were involved in sorting and grading of soya beans, threshing and winnowing of as well as value addition in addition to baking soya "mandazis'.

Table 31. Key tasks of young men and women in soya beans processing in Kakamega County

Value chain node	Male tasks	Female tasks
Processing	• Soya value addition to make soya milk, soya oil, soya roasted nuts and soya beverage • Processing of animal feeds	• Sorting and grading • Threshing and winnowing • Soya value addition to make soya milk, soya roasted nuts and soya beverage • Baking soya mandazis

Workers in the soya factory were engaged on temporarily and permanent basis and had contracts of employment that covered social protection National Social Security Fund (NSSF) and medical insurance under the National Hospital Insurance Fund (NHIF) in addition to a regular monthly pay which was in the range of K Sh 6 000–9 000 per month. Workers were also provided with protective clothing and gear including dust coats and masks.

Youth challenges or limitations in processing:

- The machines in the plant are operated manually and therefore is was difficult to produce in mass due to the labour intensive methods used.

[16] Gross margins for soya production are provided in the appendices.

Youth opportunities in processing:

- Youth can be engaged in soya value addition such as production of soya milk and soya oil which are quite popular in the market and also in roasting of soya beans. For example, from production of soya milk, youth could generate about K Sh 19 000 per month[17] and this type of business did not require a lot of capital. Youth can also market the value-added products using online platforMs

d) Youth current engagement in the distribution

Type of engagement: 12 percent of the youth in the VC were engaged in the distribution node. The mode of transport used to deliver the soya beans produce was motorcycles and pickups and the riders and drivers of the pickups were mainly young men.

Level of engagement: The youths were paid based on the distances covered and most of these youth were self-employed and either owned or leased the motor cycles. The riders also wore protective gears such as helmets and jackets which was a legal requirement to ride a motor cycle in Kenya.

Youth challenges in distribution:

- Limited storage facilities that resulted to loss of crop.

Youth opportunities in distribution:

- Youth can be engaged in selling value added soya bean products such soya milk, roasted soya beans and soya cakes or mandazi. These products are in demand and have a potential for creating job opportunities for the youth.

e) Youth engagement in the extended value chain

Provision of inputs: the main inputs used in the production of soya beans are certified seeds, fertilizers and pesticides. It was found that youth were mainly involved in transportation of inputs from the suppliers to the farmers using motor cycles. This activity was predominantly carried out by young men. In addition, youth were involved in spraying pesticides as casuals on the soya beans farMs

Youth challenges in the extended value chain:

- Limited access to certified seeds, foliar and pesticides.

Youth opportunities in the extended value chain:

- Youth can lease land for establishment of seed multiplication business.

Other VC specific services: Other VC specific services include extension services and technical advisory services in soya beans farming. It was noted that there were few extension officers to support this value chain and this provided an opportunity for youth especially those with an agricultural background to provide extension services and technical advisory services to farmers at a fee.

f) Occupational safety and health issues in the Soya value chain

- Workers in the soya value chain face similar occupational risks that other field crop workers, due to the fact that they operate various machinery and tools, they are often subject to long working hours especially at harvest time, and are exposed to various chemicals.
- Evidence of accidents - no major accidents were reported during interviews and discussions with VC actors.
- OSH measures adopted included; training of youth engaged in spraying and provision of protective gear for spraying foliar.

[17] Gross margin analysis for soya milk production is presented in the appendices.

2.3 Access to finance by youth in Kakamega

Access to financial services is critical to the success of all agricultural activities. Financial services are regarded as one of the key components of supporting the development of agricultural value chains. Whereas access to the financial services has improved in Kenya, access of these services by youth was still limited. This section presents the findings and discusses the providers of financial services, demand for financial services, types of products for agripreneurs, products suitable for the youths, challenges youth face in accessing finance, and alternative financing models available.

2.3.1 Providers of financial services, location and accessibility

This study found that there exists a number of diverse providers of financial services in Kakamega County.

i) Commercial banks

Commercial banks are the major providers of financial services. It was found that there were 12 commercial banks in operation in Kakamega County. The distribution of commercial banks was not uniform since these banks were only located in Kakamega Town and Mumias.

Commercial banks with branches in Kakamega Town included: KCB Bank Ltd, Cooperative Bank of Kenya, National Bank of Kenya Ltd, Family Bank Ltd, Equity Bank Ltd, Standard Chartered Bank Ltd, ABSA Bank Ltd, Diamond Trust Bank Ltd, Bank of Baroda Ltd, NCBA Bank Ltd, Post Bank Ltd and Spire Bank Ltd. Banks with branches in Mumias include: KCB Bank Ltd, Cooperative Bank of Kenya, Family Bank Ltd, Equity Bank Ltd and Post Bank Ltd.

ii) Microfinance institutions (MFIs)

This study found that MFIs were mainly located in Kakamega Town. These MFIs include; Kenya Women Finance Trust (KWFT), Juhudi Kilimo, Small Medium and Enterprises Programme (SMEP), Faulu Kenya, Letshego, Eclof Kenya and Starbuck Limited.

iii) Digital providers of money services

It was established that commercial banks and MFIs within the County had established digital financial services products such as KCB Mbenki, Equitel Money, NCBA Mshwari and Family Bank PesaPap. Other providers of digital financial services included; Safaricom Fuliza, Timiza, Tala, Branch and Okash amongst others.

iv) Government agencies

A number of government agencies were also providing financial services. Most of these institutions were based at the county headquarters in Kakamega town and these include: Agricultural Finance Corporation (AFC); Kenya Industrial Estates (KIE); Youth Enterprise Development Fund (YEDF); Women Enterprise Fund (WEF); Uwezo Fund; Kenya Climate Smart Agriculture Programme (KCSAP); Agriculture's Agricultural Sector Development Support Programme II (ASDSP); and Kakamega County Special County Fund for Youth and Women.

v) Non-Governmental Organizations (NGOs)

NGOs involved in provision of financial services include: Sustainable Organic Farming and Developments Initiatives (SOFDI) and Marbi Agric.

vi) Non-banking financial institutions

This study established that there were a number of non-banking financial services providers in the county and these included Savings and Credit Cooperatives (SACCOs) that offered Front Office Services Activity (FOSA) services, mobile money agents and Village Savings and Loan Association Initiatives (VSLAs). SACCOs with FOSA services included; Kakamega Vuma Daima Sacco, IG Sacco, Mudete Factory Tea Growers (MUFATE), Nitunze SACCO and Sukaria SACCO amongst others. These SACCOS have operations in Kakamega Town. It was found that there

are numerous mobile money agents and other bank agents offering financial services spread across the whole county. VSLAs were also in operation across all sub-counties in Kakamega County.

vii) Informal providers of financial services

A number of informal financial services were identified during the study. These are; Chamas, merry go rounds, Table-banking, Shylocks and Donvest credit. Though the funds available are sometimes unreliable and expensive, they are a preference to the people due to ease of access to the financial services.

viii) Insurance companies

There are a number of insurance companies in Kakamega County identified during the study. These are Xplico Insurance, Madison Insurance, CIC Insurance, AMACO, Zulmac, Down Rates, Blue-Shield Insurance, Apollo Insurance, Old Mutual. The insurance companies are located in Kakamega Town.

2.3.2 Type of financial products available for youth agripreneurs including their features i.e. pricing, repayment period, youth friendliness

The type of financial products available for youth agripreneurs are presented in the table below.

Table 32. Type of financial products available for youth agripreneurs in Kakamega[18]

Type of financial service	Providers within the county	Product features	Pricing and costs
Savings products	Commercial banks	Savings accounts earn interest on balances deposited; However, withdrawals may be restricted to once per quarter; To open an account, one requires - copy of ID, KRA Pin and one passport size photo. Mobile accounts can also be opened for those with registered mobile numbers	Interest is pegged on amount deposited in the range of 0.1–5percent p.a; Deposits and withdrawals can be made from mobile phone;
	MFI institutions		
	SACCOs with FOSA	FOSA savings account operate as ordinary savings accounts in banks and MFIs; Accounts earn interest and have allow unlimited deposits. However, withdrawals may be restricted to once per quarter	All FOSAs maintain an account with Cooperative Bank of Kenya and therefore funds can be accessed through Cooperative Bank ATMs, over the counter, Coop Agents as well as Visa branded ATMs
Loan and credit products[2]	Commercial banks E.g. Equity Bank, TransNational Bank, KWFT, Sidian Bank, Family bank, Cooperative bank, ABSA bank, CFC Stanbic	Agribusiness loans are available for purchase of inputs, assets, animals and equipment; Loan products are made to individual farmers. Loan's duration varies from one month up to five years depending on reasons for the facility; Loan products are secured against assets or livestock	Loans made at interest ranging from 13–16 percent; Loan processing fees range from 1.5–5 percent; Loans are repaid on reducing balance basis

Type of financial service	Providers within the county	Product features	Pricing and costs
Loan and credit products[19]	MFIs e.g. Juhudi Kilimo, Letshego, Musoni Kenya, Eclof Kenya, SMEP	Agribusiness loans are available for purchase of inputs, assets, animals and equipment. For example, Juhudi Kilimo which offers loans for financing crop and livestock farming; Loan products are made to individual farmers. Loan's duration varies from one month up to five years depending on reasons for the facility. Loan products are secured against assets or livestock or group-based guarantees	Loans made at interest ranging from 13–21 percent; Loan processing fees range from 1.5–5 percent; Loans are repaid on reducing balance basis or for some MFIs on simple interest basis
	SACCOS	Agribusiness loans are available for purchase of inputs, assets, animals and equipment; Loans made to individuals and groups. Loan's duration varies from one month up to five years depending on reasons for the facility;	Loans made at interest ranging from 12–15 percent; Loan processing fees range from 1.5–5 percent; Loans are repaid on reducing balance basis. Loan's size is based on amount of deposit and can range from 3–8 times the deposit saved
	Government Agencies-YEDF	Loans are made to individuals (youth) with a minimum of K Sh 50 000 and maximum of 2 million subject to security for amounts over K Sh 100 000; Youth group-based loans range from K Sh 50 000 to 2 million, Groups start at K Sh 50 000 and are graduated based on successful repayment	Loan is interest free; 5 percent management fee is charged upfront; Repayment period is one years with a grace period of two months
	WEF	Loans made to women groups or groups with at least 70 percent women membership; 1st loan start 100 000, cycle 2 K Sh 200 000, cycle 3 K Sh 350 000 and cycle 4 K Sh 500 000 up to a maximum of K Sh 750 000	Loan is interest free; 5% management fee is charged upfront;

[18] The financial products are available for youth and non-youth and conditions for access are the same for youth and non-youth.
[19] Financial institutions have tailored made some loan products for youth client. For example, Equity Bank under the Youth Africa Works Kenya Programme (YAWK) was financing youth businesses in agri-business value chains. Also, some institutions offer saving accounts with zero minimum balance and waive of fees for youth. For more details, please see Agricultural finance and the youth Prospects for financial inclusion in Kenya Annex 3.

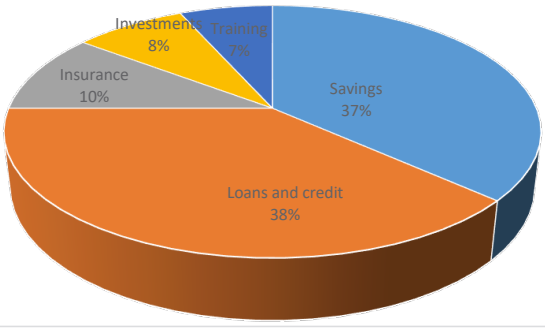
Type of financial service	Providers within the county	Product features	Pricing and costs
	Uwezo Fund	Loans made to groups of youth, women and PLWD Group based loans range from K Sh 50 000 to 2 million, Groups start at K Sh 50 000 and are graduated based on successful repayment	Loan is interest free; 5 percent management fee is charged upfront;
Insurance services	Insurance companies and banks offering bank assurance services	**Crop insurance covers**-to insure against damage to crops arising from floods, hail storms; drought, fire, excessive rainfall frost damage and lightening. This insurance is available to smallholder farmers as well as medium and large-scale farmers upon payment of insurance premiums and the type of perils covered; **Livestock insurance covers** - to insure against death of livestock arising from lightening, internal or external injury on location or on transit, fire, windstorm, snake bites and flooding. To insurance against risk of theft, death arising from terminal disease, emergency slaughter on advice from a vet, calving complications and epidermis	• Crop insurance-sum insured is based on the value of inputs or pre-agreed estimated value of harvested crop; Premium depends on type of crop insured and perils covered. Rate ranges from 4.5–6.0 percent of sum insured of crops covered; • Livestock insurance mainly covers animals 3 months up to 8 years of age. Bulls from 3 months up to 8 years of age; • Premiums are paid once in a year. Rate ranges from 4.5–6.0 percent of sum insured of livestock covered. The higher the number of animals, the lower the rate.

2.3.3 Demand for financial services by the youth

a) **Usage of and type of financial services used from formal financial institutions**

The study established that the youth sought a number of financial services from formal financial institutions with loans and credit (38 percent) being most popular, followed by savings products (37 percent), insurance (10 percent), investment products (8 percent) and training and capacity building (7 percent).

Figure 10. Most sought after financial services from formal financial institutions



The main challenges faced by youth in accessing these products and services included high costs of credit (84 percent), followed by perceived risk of using the services (66 percent), lack of collateral at (56 percent), lack of awareness (54 percent), location being too far (25 percent) and other challenges (7 percent) such as too many requirements for accessing these products, lack of guarantors, lack of farmer friendly products, uncertainties in business and fear of harassment during repossession following payment default. From discussions held with youth, it was found that there were no significant differences in challenges faced by young men and women in accessing financial services.

Table 33. Challenges faced by youth in accessing financial services from formal financial institutions in Kakamega

Type of Products	Cost of credit is high	Perceived risk of use	Lack of collateral	Lack of awareness	Location being far and not accessible	Others
Percentage (%)	84%	66%	56%	54%	25%	7%

The study further established that out of 61 youths interviewed, 24 youths (17 male and 7 female), had requested for credit from the formal financial institutions with only 1 out of the 7 (14 percent) of the young women confirming her request was successful and 5 out of 17 (29.4 percent) of the young men's request being successful.

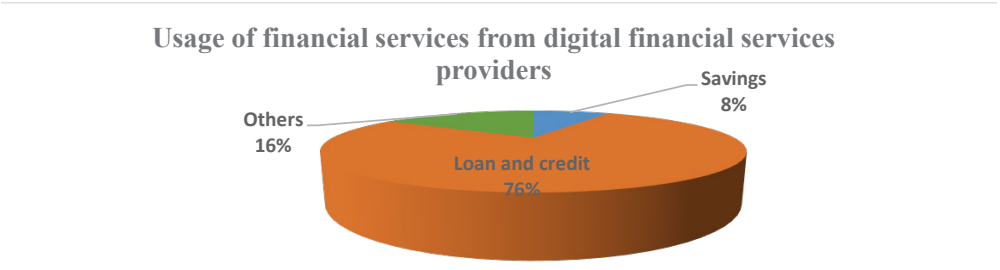
Table 34. Level of youth access to credit from the formal financial institutions in Kakamega

Response	Have ever asked for a credit from a formal financial institution?			Were you successful in your request?		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Yes	**17**	**7**	**24**	**5**	**1**	**6**
No	**25**	**12**	**37**	**12**	**6**	**18**
Total	**42**	**19**	**61**	**17**	**7**	**24**

b) Usage of and type of financial services used from digital financial services providers

This study found that youth utilized financial services from digital financial services providers such as Tala, Branch, KCB Mbenki, Mshwari, Fuliza, Mkopa, Mkash etc. The main type of service sought from these institutions were loans and credit facilities (76 percent); savings (8 percent) and other services (16 percent) such as payment of bills etc.

Figure 11. Usage of financial services from digital financial services providers



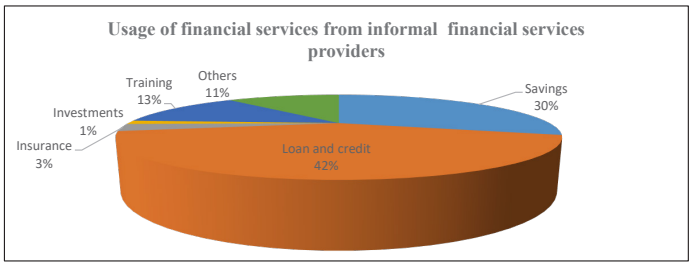
On the type of financial products that youth wished to see provided by these institutions the following was identified: Increased loan limits with lower interest rates; Insurance products and services; Online training services on financial literacy and management; and investment products and services.

c) Usage of and type of financial services from informal institutions

It was found that youth utilized financial services from informal financial institutions such as merry go rounds, table banking groups, shylocks and Village Savings and Loans Associations (VSLAs). The type of services sought included: loans and credit (42 percent); savings (30 percent); training services (13 percent); insurance (3 percent); investments (1 percent) and other services

(11 percent) such as asset finance to but assets such as agricultural tools and equipment and livestock.

Figure 12. Usage of financial services from informal financial services providers



On the type of financial products that youth wished to see provided by these institutions the following was identified: Low interest loans and higher values; Savings and investment products; Training on financial literacy and management; and mentorship programmes.

d) Sources of business finance

This study found that from amongst youth agripreneurs, the most prevalent source of finance were personal savings which accounted for between 53.3 percent (Soya beans VC) and 81.8 percent (Fish VC). The next important source of business finance was family sources comprising between 21.4 percent (Poultry VC) and 33.3 percent (Soya beans VC). From the findings the use of loans was very low accounting for between 6.7 percent (Soya beans VC) and 7.1 percent (poultry VC). Uptake of loans for dairy and fish farming was very low since these types of businesses required a higher amount of initial investment compared to poultry and soya beans.

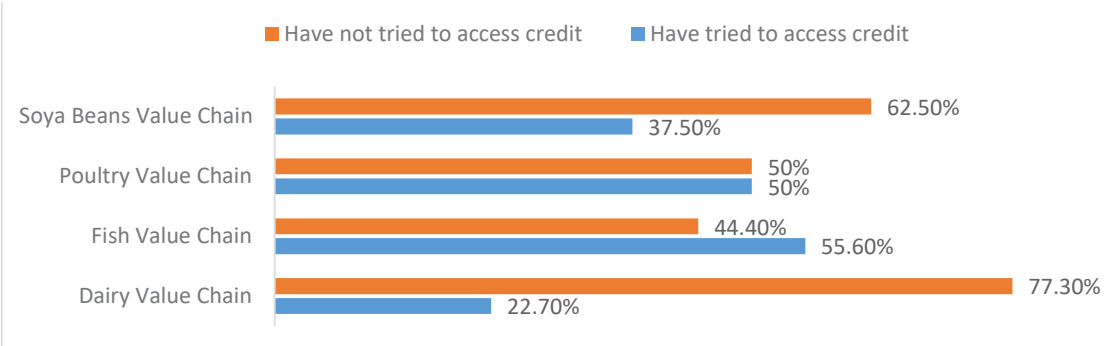
Table 35. Sources of business finance by youth in Kakamega County

Value Chain	Savings	Loan	Family	Friends	Investors	Total
Dairy	69.0%	0.0%	31.0%	0.0%	0.0%	100.0%
Fish	81.8%	0.0%	18.2%	0.0%	0.0%	100.0%
Poultry	67.9%	7.1%	21.4%	3.6%	0.0%	100.0%
Soya beans	53.3%	6.7%	33.3%	0.0%	6.7%	100.0%

e) Youth who had sought credit facilities

The study established that the percentage of youth who had sought credit from formal financial institutions (Banks, MFIs, Saccos) in each VC was; Poultry (50 percent); Soya beans (37.5 percent); Fish VC (55.6 percent); and Dairy VC (22.7 percent). These findings reveal that despite youth seeking finance from the formal financial institutions credit was very difficult to obtain.

Figure 13. Youth who had tried to access credit



The study further established that only 25 percent were able to obtain credit from the financial institutions and 75 percent were not successful in obtaining the credit. The most

significant hindrance to accessing credit by youth was lack of collateral. Besides, the size of loans for poultry and soya were much lower than what would be needed to establish dairy and fish enterprises.

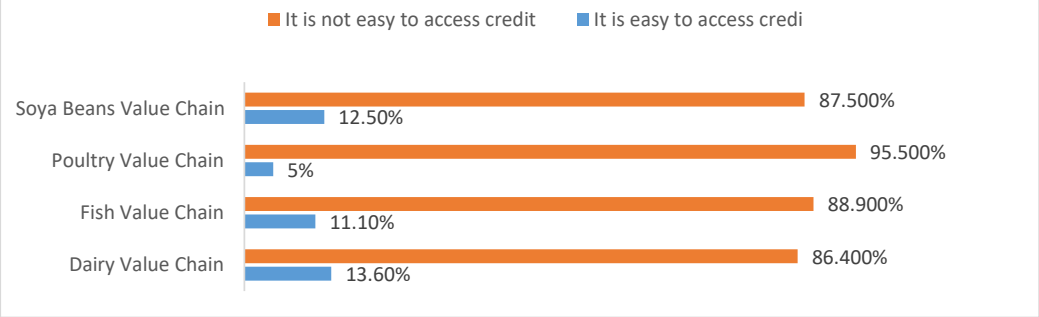
Table 36. Youth's success in accessing credit

Value chain	Yes	No	Total
Dairy	–	100%	100%
Fish	–	100%	100%
Poultry	45%	55%	100%
Soya	33%	67%	100%
Average	**25%**	**75%**	**100%**

f) Perception on ease of access to credit from formal financial institutions

This study also sought to establish youth perceptions on ease of accessing credit from formal financial institutions. It was found that most youth perceived access to credit to be very difficult for all VCs with the perception of difficulty being highest for poultry VC actors (95.5 percent) and lowest for dairy VC actors (86.4 percent) as per the figure below.

Figure 14. Perception on ease of access to credit by youth



2.3.4 Products suitable for youth

This study established a number of finance products suited for youth in agribusiness as follows.

a) **Commercial bank products**

- **KCB Bank Ltd agribusiness finance**: this product offers agribusiness finance and loans tailored to various agricultural value chains such as dairy, soya beans, poultry and fish. The products provide working capital (For purchase of seeds, fertilizers, inputs and equipment and assets) financing to farmers for a duration of three months up to one years (Based on the length of the season for the specific agricultural product) and loan sizes are based on the ability to pay by respective farmers up to a maximum of K Sh 250 million. To qualify for this financing, farmers must demonstrate ability to pay and the produce must have a specific off taker. The finance is based on a tripartite agreement between the farmer, input supplier and off taker on one side and the bank on the other.

- **KCB Foundation 2jiajiri product:** Under the Agribusiness component, this product provides financing to youths who undergo a 3 months targeted training to undertake greenhouse farming**.** The agri-business training is provided by its partner Miramar Training Institute. The financing is offered to the trained youths who form a partnership of 2 pax through support by the program's lawyer. The financing is

for up to K Sh. 800 000/= to cater for the greenhouse and working capital (seeds, fertilizer, salaries). The training institute provides a ready market for their produce. In addition to the training, the program offers free BDS services for up to 1 year in Accounting, marketing and legal services (partnership registration).

- **Equity Group Foundation (EGF), Young Africa Works (YAW) Programme:** This program targets youth who have any qualification in agriculture and are willing to undertake agricultural activities. The youths can access Ksh. 100 000 to 1 million from Equity Bank Limited. To qualify for the loan, the youth need to have a valid certificate from an accredited training institution and a bankable business plan. Youth are also expected to participate in training by EGF on financial literacy and business management prior to applying for these loans. This loan is secured or guaranteed by the parents or guardians of the respective youth. The loans are made on preferential terms with loan processing at 1.5 percent of the borrowed amount and loan disbursement is phased as per the business plan to mitigate against diversion of loan funds. The bank staff also provide post finance BDS support to monitor progress of the loan funds use. This program that begun in the year 2020 operates in partnership with agricultural training institutions. For example, EGF has partnered with Bukura Agricultural Training Centre (ATC) in Kakamega County to absorb 700 candidates under the YAW programme.

b) **Government agencies providing finance to youth in agribusiness**

- **Youth Enterprise Development Fund (YEDF): YEDF** was established in 2006 with aims of availing business funding and provision of business development services (BDS) to young people (18–35 years) in Kenya. This fund has an office in Kakamega County. YEDF has a number of loan products suitable for youth in agri-business. For example, the fund has the Agri-Biz Loan targeted at young people to acquire agricultural equipment and working capital and financing is up to K Sh. 2 000 000 at zero interest but with a 5 percent one-off management fee and repayable in three years. This loan is available to both individual youth agripreneurs and youths in groups.

  For individual youth, loans are available from K Sh 100 000 to K Sh 2 000 000. However, loans above K Sh 100 000 must be secured with title deeds, household goods or log books. In addition, the youth will need to have operated the business for at least one year and also to provide one guarantor, who must be an individual operating the same type of business. For group-based loans, the youth group needs to be registered and have a bank account and the leadership of the group (Chairman, Secretary and Treasurer) must all be youth. The group must also have a constitution and have a minimum of 15 members and the groups must have records for the existing business. Groups are started with a loan of K Sh 50 000 and this is graduated based on repayment history up to a maximum of K Sh 2 000 000.

- **Uwezo Fund:** This fund was launched in 2014 and it mirrors the YEDF and seeks to provide funding for women, youth and people living with disability at the constituency level. The fund also provides mentorship to target beneficiaries to access the preferential 30 percent of government procurement opportunities set under the access to government procurement opportunities (AGPO) program. Financing under Uwezo Fund ranges from K Sh 50 000 to 500 000 and is based on group lending at zero interest rate.

- **Women Enterprise Fund:** This fund was established in 2007 and is under the Ministry of Public Service and Gender Affairs with a mandate to provide accessible and affordable credit to support women to start and expand businesses in Kenya. This fund makes out loans to women business owners based on group lending through the Constituency Women Enterprise Scheme (CWES). The groups must be registered "chamas" with at least ten members who are 100 percent women (or at least 70 percent women and 30 percent men). Loans range from K Sh 100 000 to 750 000 at zero interest but with a 5 percent one off management fee.

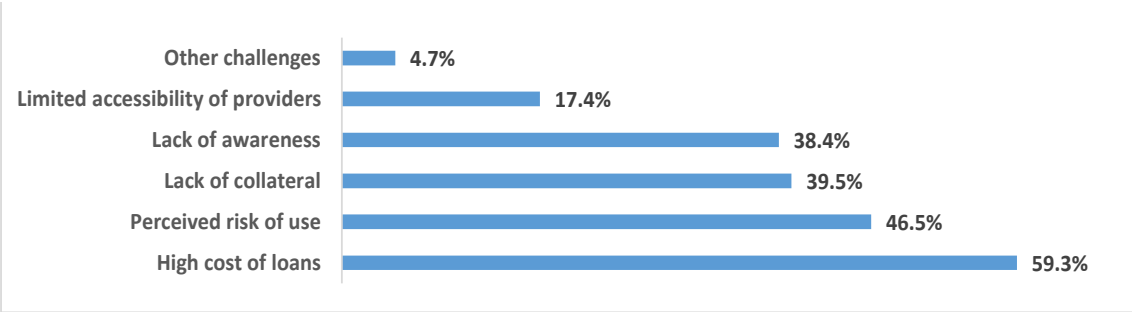
- **Agriculture Finance Corporation (AFC):** AFC was founded in 1963 with the mandate of assisting in the development of agriculture and agriculture industries through provision of loans and providing technical and managerial assistance to loan beneficiaries. To date, AFC is a leading credit institution supporting farmers to secure finance for agribusiness activities such purchase of equipment, inputs, livestock and other supplies and also provision of working capital finance for farmers. Loans are provided for individuals and groups for a duration of 1–5 years at 10 percent interest rate with a requirement of committing 20 percent towards project costs.

- In addition, AFC provides loans, grants and credit guarantees for youth in agribusiness under the ENABLE youth program. The ENABLE Program is implemented by the Ministry of Agriculture, Livestock and Fisheries (MoALF) and co-funded by African Development Bank (AfDB) and the Government of Kenya. This program aims at creating youth agripreneurers through skill acquisition and creating an enabling environment in which youth become owners of profitable agribusinesses; through training, nurturing and mentorship in the Youth Agribusiness Incubation Centres (YABICs). This program will run for five years (2019–2024) and will be implemented in eight counties - Narok, Kirinyaga, Nyeri, Nakuru, Kilifi, Kisii, Kisumu and Uasin Gishu counties.

2.3.5 Main challenge youth face in accessing finance in Kakamega County

Access to finance for the youth is a significant challenge. This study established that the most common challenges cited by youth in accessing finance for agribusiness included: Costs of loans were too high (59.3 percent); perceived risk of use of loans/fear of being auctioned (46.5 percent); lack of collateral (39.5 percent); lack of awareness of youth friendly products (38.4 percent); location of institutions was too far (17.4 percent) and other challenges (4.7 percent) such as; bureaucratic processes and too many requirements, lack of guarantors, fear of being harassed in case of default, business uncertainties.

Figure 15. Challenge's youth face in accessing finance



From financier's perspectives, it was stablished that the challenges financiers faced in delivering financial products to youth were as follows.

- Financial institutions did not trust the youth because of the perception that youth were unreliable based on banks' past experience with some youth who could not repay loans and had defaulted on repayments. For example, for the YEDF loans, national repayment rates stood at 32.2 percent and default rate was 67.8 percent.[20]

- Most youths tended to divert loan funds to other uses different from what they were financed to do;

- Youth lacked permanent places of business or residence and hence to was difficult to trace them in case of a loan default;

- Lack of awareness on existing financial products.

2.3.6 Youth alternative financing models available in Kakamega County

The focused group discussions and key informants interview held indicated that the following organizations provided alternative financing models:

a) **Sustainable Organic Farming and Development (SOFDI) -** A Non-Governmental Organization located in Mbale, Vihiga County. The organization gives inputs in form of seeds and fertilizers as a loan to soyaa beans farmers in Khwisero and Butere. The farmers pay upon harvesting for the inputs advanced with a small margin above the retail price which is quite favorable to the farmers.

b) **Marbi Agric** - A private organization in Bungoma with six mobile field offices located in Lugari, Mumias, Musanda, Ekero, Navakholo and Basuma - Samisi. The organization provides farm inputs (fertilizer and seeds of maize and other cereals) as a loan to farmers. The farmers pay a fee of 50/= every week. Upon completion of the loan, farmers are given chicks and chicken feeds, to appreciate them. To date the organization has advanced farm inputs valued more than 15 million shillings.

c) **One Acre Fund** - Supplies smallholder farmers with the financing and training they need to grow their way out of hunger and poverty. Financing is in form of farm inputs (fertilizer and seeds of maize and other cereals) as a loan to farmers. Upon completion of the loan, farmers are given chicks and chicken feeds, to appreciate them.

2.4 Access to business development services by youth in Kakamega County

Business development services (BDS) are crucial services that are provided to improve business performance and these include such services as training, coaching and mentorship, market access advice, market research, market environment, financial linkages, legal and contracting, business records, business planning and others.

2.4.1 Providers of business development services and type of products available

This study found that the providers of BDS services in the Kakamega County consisted on three players namely; National and County Government Agencies, Non-Governmental Organizations (NGOs) and religious organizations.

Table 37. Providers of BDS services and type of products available in Kakamega County

Name of Institutions	Type of BDS provided
a) National Government Institutions	
Kenya Agriculture and Livestock Research Organization (KALRO)	• Hands on training on Indigenous Chicken (IC) management • Training on hatching management, poultry record keeping, poultry health management and supervisory skills in poultry management • Training on poultry feed formulation

[20] http://www.iajournals.org/articles/iajef_v3_i2_1_20.pdf

Name of Institutions	Type of BDS provided
Kenya Industrial Estate (KIE)	• Book keeping and Record Keeping Basics • Records Management Strategies • What is a website? • Internet Marketing • Role of Website in Business Growth • Provides serviced workspace through construction of industrial estates/incubators in fast growing business centres-Kakamega has 22 sheds • Enterprises within the incubators are able to access financial support for machinery, equipment and working capital, shared utility services, management and technical assistance including skills upgrading, marketing, accounting, legal, secretarial services and internet and networking.
Kenya Forestry Research Institute (KEFRI)	• Social forestry training and climate change to enhance climate smart agriculture, • Tree nursery management practices, • Briquette manufacturing techniques, • Environmental Impact Assessments, • Forest products development.
Kenya Climate Smart Agriculture Program (KSCAP)	• Advisory and market information services • Strengthening Climate-Smart Agricultural Research and Seed Systems
Agricultural Sector Development Support Program (ASDSP)	• Supporting training of farmers in three value chains - Mango, Fish and Poultry; • Promoting commercialization of enterprises within the three value chains; • Supporting value chain innovations; • Supporting climate smart agriculture interventions, practices and technologies for the three value chains; • Promoting financial and market linkages for value chain actors
Bukura Agricultural College	• Certificate In Agriculture and Community Development • Two-year diploma ❖ Farm business Management ❖ Agribusiness Management and Marketing ❖ Agricultural Extension and Community development

Name of Institutions	Type of BDS provided
	❖ Animal Production and Health Management ❖ Agricultural Irrigation and Drainage Engineering • 2.5-year Diploma ❖ Agricultural Education and Extension (Teachers Service Commission - TSC Approved) ❖ Animal Health (Kenya Veterinary Board - KVB Approved)
Masinde Muliro University of Science and Technology	They have a school of Agriculture, veterinary sciences and technology offering post graduate, Degree, Diploma and Certificate courses in: • Agricultural Economics and Resource Management • Agri business Management and Marketing • Fisheries and Aquaculture Technology • Animal Production • Agricultural Education and Extension • Horticulture • General Agriculture • Animal nutrition • Genetics and plant breeding • Agricultural extension and rural development
b) County Government of Kakamega Institutions	
Bukura Agricultural Training Center	• Record keeping, marketing, business planning, animal and crop husbandry, aquaculture • Agribusiness development-gross margin, farm planning, record keeping, book keeping, animal and crops husbandry, fish farming(aquaculture) • Outreach programmes - 5km radius within ATC farmer visits on demand. • Pasture farming, bailing of grass and hay
c) County Technical and Vocational Colleges	
i. The Sigalagala National Polytechnic	• Food & Beverage Production, Sales and Services • Diploma in Entrepreneurial Agriculture

Name of Institutions	Type of BDS provided
ii. Bushiangala Technical Training Institute	• Supplies Management • Information Communication Technology • Social Work & Community Development
iii. Butere Technical and Vocational College	• Food and beverage • Community development and social work • Certificate in agriculture • Diploma in agribusiness management
iv. Mumias West Technical Training Institute	• social work and community development • sales and marketing • mechanical engineering (production option)
v. Rural Craft Training Centre - NYS Turbo	• Mechanical Engineering • Motor Vehicle Mechanics • Automotive Engineering
vi. Sabatia Technical and Vocational College	• Food and beverage production, sales and management • General agriculture • Cooperative management • Entrepreneurial agriculture
vii. Shamberere Technical Training Institute	• Food and Beverage Production, Sales and Service • Diploma Agriculture • Mechanical Engineering (Production Option) • Social Work and Community Development
viii. St Jude's Technical College	• Social Work and Community development • Food and Beverage Production, Sales and Services
ix. West End Institute of Science and Technology	• Information Communication Technology • Business Management
x. Western College of Computer and Technology Campus	• Information Technology • Social Work and Community • Business Management
d) NGOs and Private Institutions	
GIZ	• Technical skills, good governance, leadership, enterprise development, soft skills
Anglican Development Services	• Training • Post-harvest handling training • Soyaa Farming

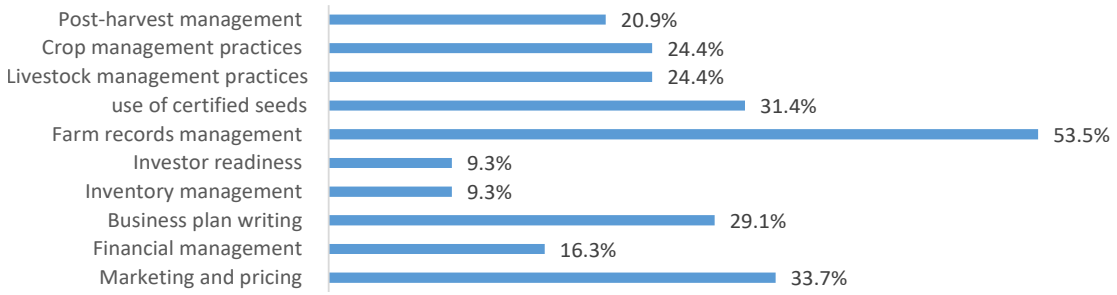
Name of Institutions	Type of BDS provided
Services, Sustainable Organic Farming and Developments Initiatives (SOFDI)	• Seed and grain production, • Proper storage, • Cooking demonstrations, • Soyaa processing • Nutrition education
Makumu Farm and Guernsey Stud of the Catholic Diocese of Kakamega	• Training farmers on sustainable dairy farming

2.4.2 Type of business development services youth have received

The study found that there were two main types of BDS services received by youth - technical skills training and business skills training. The most common areas of technical skills training consisted of topics on; post-harvest management (20.9 percent); crop management practices (24.4 percent); livestock management practices (24.4 percent); use of certified seeds (31.4 percent) and farm records management (53.5 percent). The main providers of technical training to farmers were National and County Government institutions such as ASDSP, Bukura College, KARLO and private institutions such as Cereal Growers Association (CGA).

Business skills training include; investor readiness (9.3 percent); inventory management (9.3 percent); business plan writing (29.1 percent); financial management (16.3 percent) and marketing and pricing (33.7 percent). The main providers of business skills training were banks and Micro Finance Institutions (MFIs) such as Kenya Women Finance Trust (KWFT), Equity Bank and Non-governmental Organizations (NGOs) such as Farm Africa, Anglican Development Services, Sustainable Organic Farming and Development (SOFDI) amongst others.

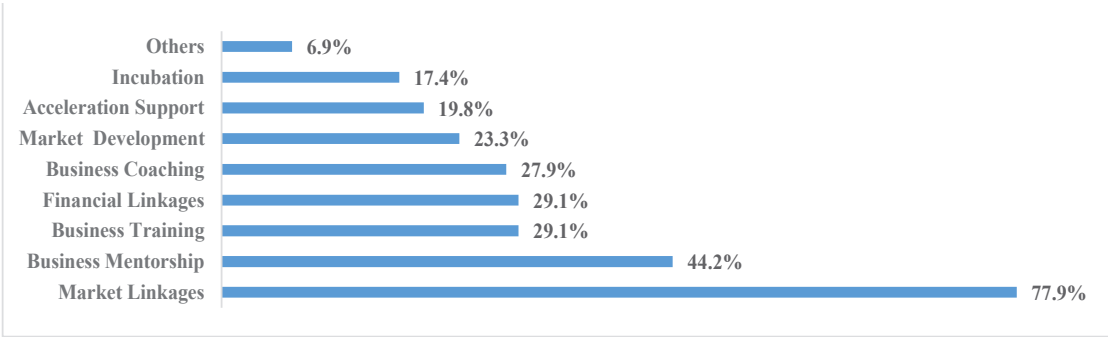
Figure 16. Type of BDS services received



2.4.3 Demand for business development services by the youth

Results on demand for BDS revealed that the most sought after BDS service was market linkages (77.9 percent), followed by business mentorship (44.2 percent); business training (29.1 percent) and financial linkages (29.1 percent); business coaching (27.9 percent); market development (23.3 percent); acceleration support (19.8 percent); incubation (17.4 percent); and other BDS services (6.9 percent) such as record keeping, proposal writing, marketing and pricing skills, investor preparedness and financial management.

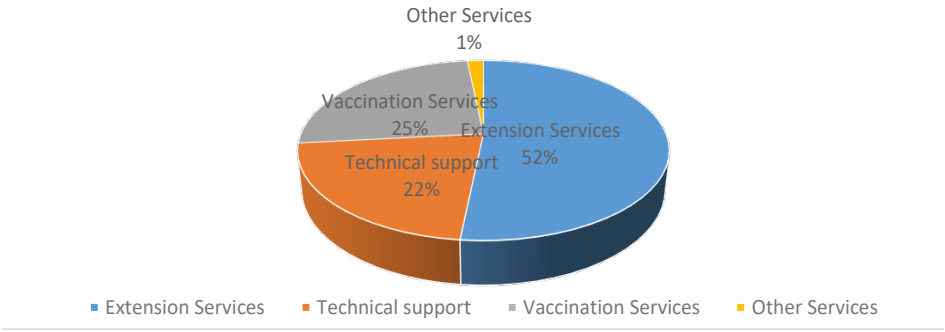
Figure 17. Type of BDS services demanded by youth



2.4.4 Engagement of youth in provision of business development services

The findings of the engagement of youth in the provision of BDS indicated that the youth were engaged in provision of some BDS services as agripreneurs and also as employees of BDS firMs For example, youths under the Kakamega County Youth in Agribusiness Association (KCYAA) were engaged in provision of training and extension services in agricultural value chains through support from development partners such as GIZ and the County Government of Kakamega. KCYAA, which was established in 2018, in an umbrella body that brings together 240 individual youths and 10 youth groups. The membership is drawn from all the 12 sub-counties in the Kakamega County. The Association was formed to champion the interests of the youth engaged in agribusiness. KCYAA has been involved in capacity building of star youth farmers in the dairy, poultry and fish VCs. The study found that the main type of BDS services provided by youth included extension services (52 percent), vaccination services (25 percent), technical support (22 percent) and other services such as training of farmers (1 percent).

Figure 18. Youth engagement in BDS provision



2.4.5 Business development services products suitable for the youth in agri-business

The study findings revealed that the youth expressed the need for provision of BDS services as follows: Dairy VC - accessible and affordable AI services, financial linkages, training on feeds formulation and feeds conservation and provision of livestock extension services; Fish VC - need for financial linkages, training on ponds construction and feeds formulation and training on costing and pricing of products; Poultry VC - Training on business planning and capital raising, financial linkages, provision of extension services and market linkages and training on costing and pricing of products; Soya VC - financial linkages, training on business planning and capital raising and market linkages and training on costing and pricing of products.

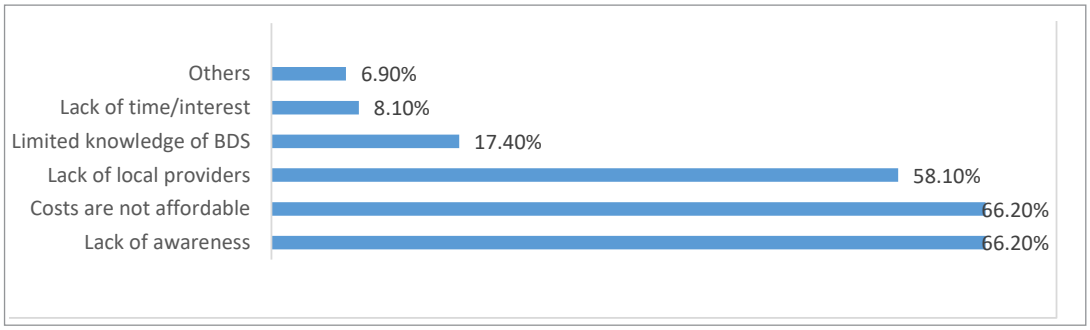
Table 38. BDS products and services needed per VC in Kakamega County

Dairy VC	Fish VC	Poultry VC	Soya VC
• Accessible and affordable AI services; • Trainings on feeds formulation and feeds conservation • Livestock extension services	• Financial linkages • Training on pond construction; • Trainings on feeds formulation; • Training on costing and pricing of products	• Training on business planning and capital raising • Financial linkages; • Provision of extension services • Market linkages; • Training on costing and pricing of products	• Financial linkages; • Training on business planning and capital raising • Market linkages • Training on costing and pricing of products

2.4.6 Challenges youth face in accessing business development services services

Findings from this study revealed that the greatest challenge to access of BDS was lack of awareness (66.2 percent) and high costs of BDS (66.2 percent). Lack of awareness of existing BDS services can be attributed to lack of information on where they can get the services even for free especially those offered by government, partners and inputs service providers. In addition, few representations of youth in governance positions in the existing youth and blended groups that benefit is also a contributing factor since the leaders are the ones informed of upcoming BDS services and they rarely appoint other members apart from themselves to attend the trainings/empowerments. Other challenges included; lack of local providers (58.1 percent); limited knowledge of BDS (17.4 percent); lack of time and interest (8.1 percent) and other factors (6.9 percent) such as low literacy levels. Lack of local providers could however been linked to lack of awareness since there are local providers identified during the study.

Figure 19. Challenges youth face in accessing BDS services



2.4.7 Opportunities available for the youth to engage in provision of business development services services

This study identified a number of opportunities for youth to engage in provision of BDS services as follows.

- Youth can take up opportunities as contracted facilitators for institutions that currently offer BDS services. For example, youth trained in crop and livestock extension can partner with existing institutions to provide BDS and extension services as part-timeservice providers.
- Youth can also provide BDS based on their own qualifications and training. For example, youth with agricultural training in veterinary can provide extension, vaccination and technical support to the farmers at a fee. This would fill the current gap experienced by

farmers of limited extension services as well provide reliable vaccination services.

- Youth who have succeeded in agribusiness can provide BDS, mentorship and incubation services to other youth in the county this can be at a fee or through a subsidized programme supported by the County Government or other NGOs.
- Youths can develop career database for matching the supply and demand for labour in agribusiness. This could be a one-stop for the employers and potential employees. This service can be taken up by the KCYAA, who can provide a validation of qualified youth in agribusiness and these data can be set up in a database for reference by potential employers.

2.5 Overview of the enabling environment for youth engagement in the selected value chains in Kakamega

This section reviews national and county government policies that provide an enabling environment for youth engagement in the selected value chains. In addition, the section also reviews the socio-cultural elements to take into consideration when engaging youth in the selected value chains.

2.5.1 National Government Policies

i) Agriculture Sector Transformation and Growth Strategy 2019–2029

The Agriculture Sector Transformation and Growth Strategy (ASTGS) 2019–2029 was formulated to transform Kenya's agricultural sector and make it a regional powerhouse. The program has 3 anchors to drive the 10–year transformation agenda namely; Increase small-scale farmer, pastoralist and fisherfolk incomes, increase agricultural output and value add, and Boost household food resilience. These anchors will be achieved through the following 9 flagships in the first 5 years;

a) Target 1 million farmers, pastoralists and fisherfolk in an initial 40 zones served by 1000 farmer-facing SMEs that provide inputs and equipment including for irrigation, processing and post-harvest aggregation

b) Shift nationwide subsidies focus to register 1.4mn high-needs farming households and empower them to access a range of inputs from multiple providers, enabled by an e-voucher delivery system.

c) Set-up 6 agroprocessing hubs across Kenya using a one-stop-shop rapid Public-Private Partnership (PPP) process for local and export markets

d) Unlock 50 new large-scale private farms (>2 500 acres) with 150 000 acres under sustainable irrigation from existing infrastructure (e.g. rehabilitate dams, dual-purpose hydro-power), with competitive bidding, and government provided infrastructure (e.g, power, roads)

e) Restructure the strategic food reserve (SFR) to better serve 4 million high-needs Kenyans through competitive digital reserve stock and cost management with private sector, and price stability managed through the Ministry of Finance

f) Boost food resilience of 1.3 million farming, pastoralist, and fishing (Arid and Semi-Arid Lands (ASAL) households through community driven design of interventions, and more active coordination of development partners and private sector resources through regional economic blocs.

g) Launch 3 knowledge and skills building programs focused on technical and management skills in the field for 200 national and county government transformation leaders, 1 000 farmer-facing small and micro enterprises (SMEs), and 3 000 extension agents.

h) Strengthen research and innovation, and launch priority digital and data use cases for

better decision making and performance management

i) Actively monitor 2 key food system risks:

1) sustainable and climate smart natural resource management including sustainable irrigation and water basin health, soil quality and land use;

2) crisis management for pests' diseases, climate and global price shocks

Early estimates indicate that the strategy could improve the lives of 3.3 million small-scale farming households (approximately 15 million Kenyans), and contribute additional agricultural Gross Domestic Product (GDP) of up to K Sh 170 billion p.a. in five years (up to K Sh 440 billion over five years). It will also have a knock-on effect on other sectors (e.g. construction and manufacturing), boosting their contribution to total GDP by up to K Sh 230 billion p.a.

ii) Agricultural Sector Development Strategy (ASDSP)

The Agricultural Sector Development Strategy Programme (ASDSP) was formulated during 2010 and 2011 and the implementation started in January 2012. The programme is funded jointly by the Government of Sweden and Government of Kenya. The overall goal of this programme is "To transform Kenya's agricultural sector into an innovative, commercially oriented, competitive and modern industry that will contribute to poverty reduction, improved food security and equity in rural and urban Kenya".

Currently, the Ministry of Agriculture Livestock and Fisheries (MoALF) is implementing Agricultural Sector Development Support Programme II (ASDSP) 2017–2022, which aims at transforming crop, livestock and fishery production into commercially oriented enterprises that ensure sustainable food and nutrition security by developing environmentally resilient and socially inclusive value chains. One outcome on supporting value chain innovations foresees the establishment of grants supporting value chain innovation with high prospects for women and youth empowerment (where an important measure of economic empowerment will be job creation either as an employer or an employee at any stage of the value chain). One of the other envisaged outcomes is on enhanced entrepreneurship of priority value chain actors.

ASDSP has addressed some of the bottlenecks of youth access to affordable credit through its provision of grants, while provision of VC specific training will help the youth identify existing opportunities in the priority VCs and also provide them a platform to develop innovations that can address other bottlenecks that hinder their participation in agribusiness.

iii) The Kenya Youth in Agribusiness Strategy, 2017–2021

Under the overall coordination of the Ministry of Agriculture Livestock and Fisheries, this strategy documents identifies eleven strategic objectives to address the challenges that hamper meaning and sustainable youth participation in agribusiness, namely: transform youth perception towards agribusiness:

a) Development of agribusiness skills, knowledge and information;

b) Improved access to affordable and youth friendly financial services for agripreneurship;

c) Enhance access and sustainable use of land;

d) Youth engagement in research and development of innovative agricultural technologies;

e) Enhance access to inputs, modern technologies and utilization of Good Agricultural Practices (GAP) to increase efficiency;

f) Increase utilization of agricultural products through value addition;

g) Improved access to affordable suitable output markets for the youth;

h) Support implementation, reviews and development of policies that create an enabling environment for youth in agripreneurship;

i) Promote youth-inclusive climate smart agricultural technologies and create green jobs for environmental sustainability; and

j) Promote an integrated approach to address cross-cutting challenges including gender disparities, cultural barriers, alcohol and substance abuse, Human Immune Deficiency Virus (HIV) & Acquired Immune Deficiency Syndrome (AIDS), weak governance and value systems amongst others.

Upon successful implementation of this strategy, it is anticipated that there will be an increased uptake of agribusiness activities by the youths thereby creating youth employment and empowerment. This strategy was adopted in the process of adoption by the Kakamega County Government.

2.5.2 County government policies

i) Kakamega County Integrated Development Plan (CIDP), 2018–2022

Kakamega CIDP, 2018 –2022 prioritizes the promotion, growth and development of crops, livestock, fisheries, irrigation and cooperatives through provision of agricultural extension services and pests and diseases control, support to applied agricultural research and technology transfer. The CIDP also prioritizes the formulation, adoption and implementation of agricultural policies, legislations, regulations and strategies, promotion of sustainable management and conservation of the natural resource base for agriculture and regulation of quality and safety of inputs, produce and products from the agricultural sector and to collect, collate, maintain and disseminate information pertinent to the agricultural sector. In addition, the CIDP has prioritized youth and gender empowerment through economic empowerment and gender mainstreaming.

To address challenges indicated in the prioritized VCs, the CIDP identifies the following sector priorities as per the table below.

Table 39. Kakamega CIDP priorities targeted at prioritized VCs.

Sector priorities	Area of support	Nature of support
Improvement in agricultural production and productivity	Training and demonstrations	• Budgeted K Sh 50 million for training farmers and establishment of demonstration plots budgeted; • Budgeted K Sh 150 million for establishment of Likuyani ATC
Livestock sector improvements	Dairy development	• Plan to distribute 3 500 dairy cows; • Plan to support 72 000 subsidized AI services • Establish 10 Smart Dairy Units; • Plan to vaccinate 290 000 cows
	Poultry	• Distribute 320 000 chicks
	Fish	• Distribute 4 800 000 fingerlings; • Distribute 288 000 Kgs of feeds under a subsidy programme; • Construct and rehabilitate 3 420 fish ponds

Sector priorities	Area of support	Nature of support
		• Distribute 2 million worth fishing gears; • Establish 13 fish feeds processing plants; • Support 34 fish hatcheries
Marketing and value addition	Capacity building of groups	• Train 79 500 cooperative members and officials; • Supply 71 coolers to cooperatives; • Disburse K Sh 280 million as working capital support to cooperatives
Youth and Gender Empowerment **Talent development**	Economically empower youth Promote gender equity	• Recruit 12 000 youths into County youth service program • Train 3 000 motorcycle riders on road safety • Economically Empower 1 500 women and 8 000 youth • Provision of car wash machines,

2.5.3 Socio-cultural elements - Formal/informal norms, unwritten codes of conduct, cultural preferences and habits to take into consideration in engaging youth in the value chains

i) Social-cultural elements

Kakamega County is predominantly occupied by the Kenyan Luhya tribe and hence, Luhya cultural preferences and inclinations were evident in the participation of youth in agribusiness. The youth in the County identified themselves as Luhya and the respondents of the interviews were also from the Luhya tribe. It was noted that a number of cultural elements had an influence in the participation of youth in the prioritized value chains.

i) The local community was culturally inclined to participate in agricultural production, however the key challenge was the small land sizes available for agriculture. The average farm size in the County is 1.5 acres for small scale holders while large scale holders have an average of 10 acres.[21]

ii) It was also observed that culturally, women had a higher participation in agriculture especially at the production level while men were more involved in the aggregation, processing and distribution aspects of the VCs;

iii) Poultry production was also inherent in the local culture and customs and majority of the households reared chicken mainly for domestic consumption since chicken meat was considered a must have during cultural events and celebrations;

[21]Kakamega County Integrated Development Plan (CIDP) 2018–2022.

iv) There was an apparent apathy and disinterest in business and more so agribusiness which was grounded on the lack of an entrepreneurial culture. Accordingly, agriculture was mainly practiced for subsistence and many locals - youth included - were yet to recognize agribusiness as a potential for decent employment opportunities;

v) The land tenure system favoured men while women and youth lacked access to land for agricultural production. Many parents were reluctant to give the young people land to establish agribusiness initiatives and this tended to discourage youth willing to venture into agribusiness. Young women were more disadvantaged since culturally they are cannot be given land by their parents since they are "temporary residents'.

vi) Youth's natural impatience and drive for instant income and wealth had affected their pursuit of agribusiness which required nurturing, passion and resilience as stated by several stakeholders in the County.

vii) There was also an apparent "fear' amongst most locals of taking loans to invest in agribusiness activities. Locals shared narratives of many people who had suffered due to defaulting on loans and who had lost all their property to auctioneers and other debt recovery activities. These experiences discouraged many locals from seeking credit from financial institutions.

ii) Physical infrastructure

Roads: The Kenya Vision 2030 recognizes the need for seamless road network connectivity to spur economic growth through infrastructure development. According to the Kenya Roads Board, (KRB) - Roads Inventory and Conditions Survey (RICS) report, 2016 and the Kakamega county infrastructure status report (2016) the total inventory of roads in the County is at 4,451.3Km. This includes 2,236.17 Km for gravel, 1,308.90 Km for earth surface and 939.32 Km for narrow unpaved roads. The bitumen and gravel standard roads in the county stands at 307.5 Kilometres and 2 792.25 Kilometres respectively. The county government has spearheaded the construction of 44.8 km and 1 700 km of bitumen and gravel roads respectively. In addition, a total of 589.5 km have been routinely maintained to ensure efficient road network. The ongoing construction of the Kisumu-Kakamega-Kitale road and the rehabilitated Kisumu - Ebuyangu - Mumias Bungoma road by the National government will propel the county to a higher level of competitiveness leveraging on this opportunity for growth. Improved road network has enabled more producers and buyers to access markets and collect products respectively. The youths, who were motorcycle riders have a wider coverage to provide their transport services to all the actors in the VCs. The improved road network has also significantly reduced motorcycle accidents and wear and tear as well as enhancing safety of eggs and milk during delivery. Although an improved road network would presume increased use of other modes of transport such as cars or small trucks to make deliveries in agricultural value chains and to take advantage of the economies of scale, it was noted that motor cycle transport was still preferred due to the cost effectiveness of this mode of transport.

Railway network: It was noted that the county has 35 km of railway line with two railway stations namely: Lugari and Butere. However, these were underutilized. There was need for collaboration with the Kenya Railways and other stakeholders to service and operationalize the railway to boost the county's economy. Revival of the railway transport within and outside the county would provide an avenue for safer and affordable distribution of bulky agricultural produce outside the county and also receipt of bulky input cargo in through a more affordable channel. This will open up the county's access to diverse markets and hence obtain better prices for their produce while accessing cheaper inputs.

Airport and airstrips: The County have two air strips, one in Kakamega and the other in Mumias. The strategic position of the county having proximity to the Kisumu and Eldoret International airports which are 60 kilometres and 120 Kilometres respectively presents an opportunity for trade. There is need to upgrade and expand these airstrips. Operationalization of the airstrips will provide an avenue for faster and affordable distribution of agricultural produce outside the county and country. This will open up the county's access to diverse markets and hence obtain better prices for their produce.

ICT: ICT is a major service enabler for Kakamega County development as well as a source of employment for the citizenry especially the youth. The adoption and use of ICT has been on the rise in the county because of the numerous available opportunities but more needs to be done to increase the rate of adoption. The Fibre Optic cable for Internet connectivity has reached Kakamega and covered some areas in the county along the main tarmac road within Kakamega town. A few organizations and institutions along the main road leading and passing through Kakamega town are accessing this. Mobile telephony in the county enjoys about 85 percent coverage in Kakamega County. The rapid pace of penetration of mobile telephony has led to provision of new products and services, as well as providing breakthrough in sectors such as Health, Agriculture, Education and access to finance. The network for the major service providers in the county such as Safaricom, Bharty Airtel, Orange, Yu is all within the county. There are 94 cyber cafes and others are coming up. Enhanced ICT environment will enhance connectivity speeds and reduce costs for accessing internet. The youths can utilize this opportunity to expand their agribusiness knowledge, learn new value addition skills, market their products online as well as establish online marketing platforms for market linkages of producers, input supplier and customers.

Energy: According to the Kakamega Multiple Indicator Cluster Survey report 2013/14, 79.2 percent of the county population use wood as their main source of energy, 1.1 percent use Liquefied Petroleum Gas (LPG), 0.6 percent use biogas, 13.8 percent use charcoal and 1.2 percent use grass/shrub while cooking as alternative sources of solid fuel.The Kakamega Statistical Abstract (2015) indicates that a paltry 5.6 percent of the county's population use electricity for cooking compared to the country's 22.7 percent while a 92.4 percent use paraffin for lighting compared to the Country's 69.5 percent . In overall, 95.8 percent of the household population in the county use solid fuels for cooking against a national figure of 82.5 percent . About 18 percent of the households have electricity (29 percent urban and 6 percent rural areas) and a total of 37 electric high masts lights in major trading centres such as Kakamega, Mumias urban areas have been erected. This has enabled the road side and market traders to sell their merchandise for longer hours hence increasing their income. The street lighting has also enhanced security and enabled motorbike riders who are mainly youth to operate longer hours in a more secure environment. Renewable energy is gaining prominence and is being used by some sectors in their solar powered projected. There is need for the prioritization of electricity reticulation and use of solar. This will reduce production costs and improve the livelihoods of the people. Hatcheries and processors will minimize their operational costs and expand their businesses due to reduced cost of energy by using solar.

Cooperatives: The County has 164 cooperatives of which 123 are active cooperative societies with savings of 5.5 Billion shillings. These cooperatives were important in the mobilization of savings. Majority of the cooperatives were agriculture-based dealing with marketing and value addition. For example, the dairy cooperatives were the most active and addressed marketing challenges by identifying reliable milk processors who bought milk from farmers hence guaranteeing farmers' payment for milk delivered. The cooperatives also provided affordable credit for inputs to their members which was recovered from sale of produce. Youth engagement in the cooperatives was mainly through provision of transport services by use of motorcycles, employment as casuals for example to clean the milk jars, load and off–load the milk cans and engagement as office assistants. Youth membership in the cooperatives was minimal but some cooperatives had youths in leadership positions. For instance, Springfield Cooperative Society, whose current chairman was a youth.

Public Benefits Organizations (PBOs): Kakamega county has a large number of Public Benefit Organizations such as Community Based Organizations, Self Help Groups, Faith Based Organizations, and youth and women groups. Active NGOs in the County include Aphia Plus, Africa Medical Research Foundation (AMREF), Saipeh, Institute of Children Services, One Acre Fund, Habitat Aid Initiatives, Action Aid, Grass Root Community Development, Muma Rural Development Forum, Community Asset Building and Development Asset (CABDA), Constituency AIDS Control Committee (CACC), SOFDI, Anglican Development Services, Farm Concern, Kakamega Environmental Education Program (KEEP) and Western Education Advocacy and Empowerment Program (WEAEP) among many others. Proper coordination and partnerships should be emphasized to avoid duplication of activities.

2.6 Value chain(s) governance and youth representation within governance mechanisms

Minimal engagement of the youth in the value chains has resulted to minimal involvement of the youth in the governance mechanisMs The parents who are the founder members of most of the CBOs, cooperatives and community groups have recently been deliberate to invite the youth to become members of these associations. Some associations have also deliberately allotted some leadership positions to the youth for succession purposes. An example is Springfield Cooperative Society whose current chairman is a youth.

2.7 Youth-centered upgrading strategies and recommendations for the prioritized value chains in Kakamega

2.7.1 SWOT analysis of each value chain in terms of youth participation in different value chain segments and service provision

i) Poultry VC

Strengths	Weaknesses
• Youth with agricultural expertise in veterinary and agronomy. • Youth have relatively high level of knowledge on poultry production • Technological knowhow by youth; can access information and establish market linkages. • Little land space required for poultry production that is accessible to youth • Many options for off-farm activities	• Limited information by youth on existing opportunities in the poultry VC • Limited access to land which is a major production factor. Scarcity and unwillingness by parents to give youth land space a major limitation • Lack of prioritization of youth in provision of subsidized one-day old chicks by the County government. • Lack of collateral to enable the youth obtain financing from financial institutions
Opportunities	**Threats**
• Unmet demand for day old chicks and eggs in the county - more producers needed • New financial products targeting youth in agribusiness • Unmet demand for poultry feeds within the county • Processing and aggregation VC nodes yet to be exploited • Limited extension services from government - trained youths can provide the services at a fee • Unreliable vaccination services-youth can provide the services at a fee • Limited knowledge of farmers in bookkeeping and farm management • Limited market information-provide online market linkages	• Cheap imports of day-old chicks and eggs from Uganda • Unregulated market for poultry • High costs of feeds

i) **Dairy VC**

Strengths	Weaknesses
• Youth with agricultural expertise in veterinary and agronomy. • Farmers have relatively high level of knowledge on dairy production • Existing farmer cooperatives, willing to cede leadership positions for the youth. • Technological knowhow by youth; can access information and establish market linkage	• Limited information by youth on existing opportunities in the dairy VC • Limited access to land which is a major production factor in dairy. Scarcity and unwillingness by parents to give youth land space a major limitation • Youth-unfriendly requirements to access County's "one-cow initiative'. • Lack of collateral to enable the youths obtain financing from financial institutions • Negative perception of youth to farming-still searching for "white collar jobs' and motorbike riding
Opportunities	**Threats**
• Unmet demand for milk in the county-more producers needed • Upcoming milk processing plant in the county - will provide employment opportunities for the youth • New financial products targeting youths in agribusiness • Unmet demand for fodder and animal feeds within and outside the county • Limited extension services from government - trained youths can provide the services at a fee • Limited knowledge of farmers in bookkeeping and farm management • Limited market information-provide online market linkages	• Diminishing land sizes, due to increased population • Milk importation from neighbouring counties • High costs of feeds and scarcity of animal feeds ingredients like sunflower cake

ii) Fish VC

Strengths	Weaknesses
• Youths with agricultural expertise in agriculture. • Farmers have relatively high level of knowledge on fish production • Technological knowhow by youths; can access information and establish market linkage	• Limited information by youth on existing opportunities in the fish VC • Limited access to land which is a major production factor in fish farming. Scarcity and unwillingness by parents to give youth land space a major limitation

	• Youth-unfriendly requirements to access county's free fish fingerlings and subsidized feeds. • Lack of collateral to enable the youths obtain financing from financial institutions • Negative perception of youth to farming still searching for "white collar jobs' and motorbike riding
Opportunities	**Threats**
• Unmet demand for fish in the county more producers needed • Existing fish processing plant in the county will provide employment opportunities for the youth • New financial products targeting youths in agribusiness • Unmet demand for quality fish fingerlings and feeds in the county • Limited extension services from government - trained youths can provide the services at a fee • Limited market information provide online market linkages • Technology driven BDS solutions and ecommerce platform/s	• Diminishing land sizes, due to increased population • Fish importation from China • High costs of feeds and scarcity of animal feeds ingredients like sunflower cake

iii) Soya VC

Strengths	Weaknesses
• Youths with agricultural expertise in agronomy. • Farmers have relatively high level of knowledge on soya production • Existing farmer groups and associations, willing to accommodate the youth. • Technological knowhow by youths; can access information and establish market linkage	• Limited information by youth on existing opportunities in the soya VC • Limited access to land which is a major production factor in soya. Scarcity and unwillingness by parents to give youth land space a major limitation • Lack of collateral to enable the youths obtain financing from financial institutions • Negative perception of youth to farming still searching for "white collar jobs' and motorbike riding

Opportunities	Threats
• Unmet demand for soya beans within and outside the county more producers needed • Existing soya processing plant in the county that is underutilised provides market and employment opportunities for the youth • New financial products targeting youths in agribusiness • Limited extension services from government trained youths can provide the services at a fee • Transportation of soya beans from farms to collection centres and processing plant • Limited market information provide online market linkages • Ease of access to seeds and inputs through the association.	• Diminishing land sizes, due to increased population • Importation of soya beans from other countries

2.7.2 Root causes of constraints limiting the generation of decent jobs for youth in the selected value chains

a) General constraints for all value chains

i) **Limited extension services**: it was noted that provision of crop and livestock extension services to farmers was a challenge which was majorly affected by low budgetary allocation. As a result, crop and animal productivity was below optimum due to limited knowledge by farmers on good agricultural practices, management of pests and disease outbreak amongst others. As a result of challenges, creation of decent jobs in farming was an uphill task.

ii) **Low market linkages**: it was noted that limited market linkages was a key challenge that affected all products in the four identified VC. As a result many farmers fetched low prices for agricultural produce which affected the viability of many enterprises and limited the creation of decent jobs especially for young people.

iii) **Limited access to BDS**: the limited access to BDS such as trainings, mentorship and incubation services are a significant constraint especially to youth led and youth owned businesses that limited growth of these businesses and also affected generation of decent jobs within these VCs.

iv) **Poor leadership and performace of cooperatives / groups**: It was noted that cooperatives and groups set up to promote marketing of agricultural products were sometimes affected by poor leadership, conflict and lack of member motivation which led to collapse of these organizations thereby leading to loss of jobs. These factors were a disincentive for youth to join the cooperatives. Perhaps with capacity building and sensitization, youth can form groups or farmer organisations that would avoid these pitfalls.

v) **Negative perception to debt**: many locals in Kakamega were averse to credit financing, because of fear of being auctioned, especially their land which, was one of the collaterals needed by the financing institutions to access credit. These factors

negatively affected growth of agribusiness enterprises and the generation of decent jobs.

b) Constraints in the poultry value chain

i) **No bulk processing activities**: there was no chicken processing plant in the county that would offtake and add value to chicken products.

ii) **High cost of poultry feeds**: farmers highlighted that the cost of feeds - chick mash, growers and layers mash - was very high, making poultry venture unviable. Due to this factor, many farmers sold chicken before full maturity to cut on costs of feeds.

iii) **Inadequate funds to start the enterprise**: For one to start a poultry enterprise, one has to have a start-up capital to construct the poultry house, purchase chicks and feeds. All these require capital which most youth cannot afford.

iv) **Incidences of diseases**: it was established that Newcastle Disease, Fowl Pox, typhoid and Gumboro were the most prevalent diseases affecting poultry farmers in the county. This was made worse by lack of extension services and limited information by farmers on disease management in addition to high costs of vaccines.

v) **Lack of market information**; farmers mainly sold chicken in the local markets and had not ventured to other markets outside the county and neither were farmers aware of the different demand-supply cycles for poultry.

vi) **Scarcity of hatching eggs** and the high cost of establishing and running a hatchery was also a significant challenge in scaling up poultry production.

vii) **Influx of cheap imports of eggs and chicken from Uganda** contributed unfair competition and forced farmers to sell products at unfavorable prices.

viii) **Limited access to credit and loans**: due to limited access to loans and credit farmers were not able to establish processing facilities which would contribute to creation of decent jobs for youth in the chicken VC.

ix) **Theft of chicken**: this limited the number of birds stocked by farmers since had to create space inside their houses for the birds to sleep in to forestall theft of chicken.

a) Constraints in the fish value chain

i) **Lack of storage services**: this led to post - harvest losses due to fish going bad and quick sale of the fish at throw-away prices to minimize losses.

ii) **Inadequate market information** on available markets with better prices for fish.

iii) **Unreliable fish supplies**: Fish supplied was not adequate to sustain processing activities in the County. This was mainly due to low production combined with high demand for fish.

iv) **Accessing inputs was difficult**: fish feeds and fingerlings were very expensive. This led to early harvesting of and hence low weights of harvested fish and consequently low market prices.

v) **Poor breeds of fingerlings**: some of the fingerlings available in the market were of low quality and which contributed to stunted growth and low quality yields of fish.

vi) **Limited access to credit and loans**: due to limited access to loans and credit farmers were not able to establish fish aggregation and processing enterprises which were profitable ventures that can also create employment.

b) Constraints in the dairy value chain

i) **Lack of market information**: in some instances there were areas in the county that had milk deficits while others had a surplus. However, this information was not available to farmers.

ii) **Low milk production** in the county hindered established of processing activities which had a huge potential for generation of employment opportunities. The low milk production has also restrained the activities of aggregators.

iii) **Lack of many reliable bulk buyers**: consistent prompt payments was the key determinant for selecting a buyer especially for the cooperatives to guarantee payments to the farmers. However, it was found that there only two reliable milk processors who purchased milk from cooperatives and this limited the options available for securing better milk prices.

iv) **Land size limitations**: Kakamega county is one of the most populous rural counties in Kenya and land portions available for farming activities were very small, yet dairy farming required ample land especially for fodder establishment. As a result, commercial dairy farming activities were limited to Likuyani and Lugari Sub-counties were farmers had sizeable pieces of land.

v) **High cost of animal feeds** was a limiting factor to establishment of viable dairy enterprise.

c) **Constraints in Soya value chain**

i) **Land access limitations**: Land used to produce Soya beans was small to medium scale due to the limitations of land in the county. An acre of land has capacity to produce 1000–3000 Kilograms bags of Soya beans.

ii) **Inadequate soya bean supplies** limited the amount of soya value added products produced by the existing soya beans processing plant in Khwisero Sub-county.

2.7.3 Opportunity finding for youth in the core and extended value chain

The main objective of this study was to identify opportunities for youth productive engagement in the four prioritized value chains in Kakamega County. The following table summarizes the opportunities identified by each node of the four core and extended value chains. This is outlined through the following columns;

- **VC Node**: Core Value Chain (production, aggregation, processing and distribution) and Extended Value Chain (inputs and VC specific activities).
- **Task/Job youth not currently engaged**: these are tasks currently being done but not by the youth.
- **Task/Job youth's current engagement can be upgraded/expanded**: tasks being done by the youth but they can achieve more through an upgrade or expansion of the engagement.
- **Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts):** tasks that need improvement of modification for the youth to enjoy decent work opportunities.
- **Opportunities not exploited**: these are opportunities existing in the VC nodes but the youth are yet to exploit them.

Table 40. Opportunity finding for youth in the core and extended value chains

A. Poultry

S/ No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
1.	Production	Commercial hatchery	Group based poultry rearing	Contract farming	Chicken brooding
2.	Aggregation	Bulk aggregation	Market linkages	BDS, uptaker contracts	Moderation of supply and prices
3.	Processing	No major processing activities involved in apart from defeathering and slaughtering	In selling cooked chicken, small parts	Mechanization of processing activities	Industrial production, processing of by products
4.	Distribution	Information based trading	Market knowledge	Contract supply	Guarantee supply
b)	**Extended Value Chain**				
1.	Inputs	Selling of agrovet products such as drugs, vaccines, pesticides, herbicides, certified seeds, farm inputs and equipment etc	Training and Market information, Tech inputs	Contracting with producers, supplier	Extension services
2.	VC Specific Services	Value addition, processing of by products	Innovation on technology, extension services	BDS, Market linkages, peer to peer mentorship	Bulk production, processing, supply

B. Dairy Value Chain

S/ No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
1.	Production	Feeds and fodder Production	Group based investment in feeds and fodder production for cost sharing	Contract farming	Bulk production feeds and fodder
2.	Aggregation	Bulk aggregation of milk	Market linkages	BDS, uptaker contracts	Moderation of supply and prices
3.	Processing	No processing activities engaged in	In selling fresh milk, yogurt, cheese, sour milk, butter	Mechanization of processing activities	Industrial production, processing by products
4.	Distribution	Information based trading	Market knowledge	Contract supply	Guarantee supply
b)	**Extended Value Chain**				
1.	Inputs	Selling of drugs, vaccines, AI semen etc.	Training and Market information, Tech inputs	Contracting with producers, supplier	Extension services
2.	VC Specific Services	Value addition, processing of by products	Innovation on technology, extension services	BDS, Market linkages	Bulk production, processing, supply

c) Fish

S/ No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
1.	Production	Supplies e.g. nets, bait, boats etc. fish feed formulation	Mechanization, capital investment	Group investment in pond and cage farming, feeds formulation	Cage and pond farming

2.	Aggrega-tion	Provision of Cold storages services	Procure storage facilities	Contract pro-ducers, buyers, group-based investment	Moderation of supply/price
3.	Processing	Value addition of fish	Processing of fish shrimp, fish burgers and fish sausages	Working conditions and mechanization	Value addition activities such as filleting, fish burgers and sausages
4.	Distribution	Marketing of fish	Capacity to distribute more fish through cold storage and channels enhancement	Modernization of distribution tools	Increased Capacity to distribute and modernization of the distribution tools
b)	**Extended Value Chain**				
1.	Inputs	Inputs selling	Increasing capacity to sell inputs	Marketing and sales of inputs	Making and stocking
2.	VC Specific Services	Fish feeds making	Functional processors	Contracting	Affordable fish food

D. Soya

S/ No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
a)	Production	Owner production of Soya beans	Leased land, contract farming, BDS, Investment	Shared crop ownership	Leased farming
b)	Aggregation	Bulk up takers	Processer contracts, market access	Enhanced wages, benefits	Market linkages, preservation
c)	Processing	Factory based processing	Enhanced processing and preservation	Mechanization, drying, canning beans	Canned soya beans production, value addition of Soya; yoghurt, milk, roasted nuts and soya drink
d)	Distribution	Bulk distribution using vans	Value added products and by products	Market linkages, capital investment	Supply and price moderation

b)	Extended Value Chain				
1.	Inputs	Stockists, marketers	Mechanization, BDS, group-based investment	Supply chain management, land leasing (seedling)	Extension services,
2.	VC Specific Services	Canned soya beans packing	Functional processers	Contracting	Investment in processing

A. Opportunities in poultry VC

i) **Brooding of one-day-old chicks:** youth can purchase one-day old chicks from hatcheries at K Sh. 100 and brood them for 1 month and sell off at K Sh. 250 per chick**.** This they can do as individuals or as a group to enjoy economies of scale and shared investment costs.

ii) **Feed formulation:** Feeds were a major challenge in poultry production due to high costs of these inputs. The youth could carry out research and participate in trainings on feed formulation and be engaged in training farmers on feeds formulation or alternatively youth could formulate feeds for sale to the poultry farmers.

iii) **Training of farmers**: Youth could take up opportunities for training farmers on poultry production and on feeds formulation for the poultry enterprise; they can offer these services as individuals or as employees of BDS or Input suppliers.

iv) **Offering vaccination services to poultry farmers:** many farmers reported it was a challenged to obtain quality and reliable vaccines. The youth could offer vaccination services to the farmers at a fee targeting the one-day old chicks to 4 months old chicken.

v) **Enhance aggregation of chicken and eggs;** the youth have an opportunity to establish poultry cooperatives to enable aggregation of chicken and eggs. Through this cooperative model, the youth can be able to mobilize capital and also negotiate with off takers for purchase of chicken products.

vi) **Upscale cooking and selling of poultry products:** They can value add their own flock or buy from other farmers.

vii) **Establish hatcheries as individuals or as groups:** The youth can come together and form groups and establish hatcheries for hatching chicks and sell as one-day-old chicks.

B. Opportunities in dairy VC

i) **Fodder production and conservation:** There is great opportunity for business and employment in fodder production and conservation. There are good examples of youth who have excelled in this area especially in Lugari and Likuyani Sub-county, for example Matende Farm in Lugari is run and managed by youth;

ii) **Provision of extension services to farmers** e.g. AI services especially those who have agricultural training;

iii) **Farm management:** Most dairy farmers are aged and require assistance in proper management of their farms in terms of record keeping, ensuring all guidelines are adhered regarding feeding, milking and disease management.

iv) **Establishing small businesses in milk value addition and milk Automated Teller Machines (ATMs)**

v) **Engage in milk aggregation:** They can do this by forming cooperatives that will be

youth specific addressing youth challenges in the value chain.

vi) **Provision of transport service**s: Young men can provide transport using motorcycles which can easily manouveur various terrains and are affordable for small scale dairy farmers.

vii) **Generation of clean energy:** This is by constructing biogas plants to transform cow manure and slurry into energy for cooking and lighting.

viii) **Selling of slurry and raw manure:** The youth can establish market linkages for the slurry and raw manure from the dairy farmers and other farmers who have adopted organic farming.

ix) **Supplying dairy equipments and materials** such as milk cans, milking machines and silage choppers

C. Opportunities in fish VC

i) **Value addition of Fish:** Youth can engage in smoking, drying and frying of fish for preservation and sale

ii) **Fish pond construction:** Youth can provide pond construction services.

iii) **Fish pond farming**: Youth can lease land for establishment of fish ponds;

iv) **Provision of extension services** to fish farmers which are limited and youth with technical knowledge on fisheries can provide extension services at a fee;

v) **Feed formulation**: There is a shortage of fish feeds and demand is relatively high. Youth can therefore establish fish feeds production and provide and sell affordable feeds to fish farmer.

vi) **Establishment of fish cold rooms** for use/lease to farmers and traders. This can be done as individuals or as a group investment for cost sharing of capital and operational costs.

vii) **Transportation of fish** from farmers to traders and buyers with motor cycles fitted with cooler boxes for better service and quality assurance

viii) **Engage in fish aggregation services:** The youth can buy fish from producers at K Sh. 200/piece and sell at K Sh. 250/piece.

D. Opportunities in Soya VC

i) **Provision of spraying services**: Youth can provide value added services in production such as spraying of crop which does not require a huge investment but which can be a source of income. The youth can earn upto K Sh. 600/= for spraying foliar per acre which takes approximately 2 hrs.

ii) **Soya bean seed multipliers:** To benefit from high returns of production, the youth can engage in soya bean seeds multiplication. One Kg of seed can be sold for K Sh. 100 per kilogramme as compared to the beans which sell at and average of K Sh. 50–60 per kilogramme.

iii) **Soya bean production**: There is opportunity for leasing of land to establish soya beans production. With land youth can establish soya production in groups or as individuals. Land can be leased at K Sh.10 000/=per acre per year and produce soy beans for at least 2 short cycles of 3 months and I long period cycle of 6 months.

iv) **Provision of Transportation services:** The youth can be engaged in transportation. To make it more efficient, they can acquire or lease pickups for ease of collection and delivery of large quantities. The pickups can be leased on a need basis for better returns.

v) **Provision of marketing services**: Youth can source for additional markets to ensure the farmers get the best price for their produce and also make better profits. Marketing through existing online marketing forums can be a good start and the youth can charge a commission on sales made.

vi) **Value addition of soya** to produce yoghurt, roasted soya nuts, soya milk and soya oil. This can be done on small scale in their homes, as individuals or youth groups for capital and operational costs sharing. Soya oil is a very lucrative business with no need for packaging since there is adequate local market.

vii) **Engage in aggregation services:** The youth can do this by sourcing for markets and then buying soybeans from farmers for already identified markets. This will eliminate the need for having storage space.

3 STUDY FINDINGS FOR SIAYA COUNTY

3.1 Overview of Siaya County

Siaya County is one of the counties in the former Nyanza Province in the South-Western part of Kenya. It is one of the ICA Project areas. It borders Kakamega County and Vihiga counties to the north, Busia County to the North West and Kisumu County to the southeast. It shares a water border with Homabay County, which is located to the south of Siaya County. The county is divided into six administrative sub counties namely; Gem, Ugunja, Ugenya, Alego, Usonga, Bondo and Rarieda. The sub counties are further sub-divided into wards with the county having 30 wards. Alego Usonga, Bondo and Gem sub counties have six wards each; Rarieda, Ugenya and Ugunja sub counties have five, four and three wards respectively. Of the six sub-counties, Alego Usonga is the largest with an approximate area of 605.8 km^2 while Ugunja is the smallest with an approximate area of 200.9 km^2.

Figure 20: Map of Siaya County



Source: KCSEPDF.CO.KE. 2022. Also available here: https://kcsepdf.co.ke/siaya-county-profile/

3.1.1 Ecological conditions

Siaya County spreads across agro-ecological zones LM1 to LM 5. According to the Kenya Soil Survey and Integrated Regional Development plan for the Lake Basin Development Authority, the lower part of the County and especially the shores of Lake Victoria can be categorized into semi-humid, semi-dry Lower Midland zones (LM4 and LM5). These zones cover the whole of Uyoma in Rarieda Sub-county and Yimbo in Bondo sub-county. The lower central parts of the county, covering the whole of Sakwa and Asembo in Bondo and Rarieda Sub-counties respectively and the lower parts of Boro Division are classified as the midland zone LM3. The northern part of the County comprising Gem, Ugunja and Ugenya Sub-counties and the upper parts of Boro Division in Alego Usonga Sub-county are classified as the low-midland zones (LM2 and LM3). These are sub-humid and humid zones with reliable precipitation. There are also pockets of upper midland zones (about 30sq.kms) in Yala Division, Gem Sub-county with a high potential for agricultural activity.

Approximately 2059 square kilometres of land is arable and a major form of land use is peasantry agriculture. Only small portion of Siaya town has been planned for industrial use. There is need to demarcate more land for industrial use in major urban centres in the county. Most of the lands in the rural areas are under general boundaries prone to a lot of boundary

disputes, while in Urban centers there are fixed surveys which are free from disputes. The first category requires that these general surveys be georeferenced to reduce the number of disputes arising from the boundaries.

The average farm size for a small-scale farmer is 1.1 hectares while that of a large-scale farmer is 2 hectares. The average farm size is 0.8 ha for Gem and Ugunja; 1 ha for Alego Usonga, Bondo and Rarieda and 2 ha for Ugenya. Due to small farm holdings and the resulting limited benefits of economies of scale, the practice of mechanized agriculture is heavily constrained. (Siaya County Integrated Development Plan, 2018–2022)

3.1.2 Population size and composition

As per KNBS, 2019 the county population was 993 183 consisting of 471 669 males (47.49 percent) and 521 496 (52.5 percent) females as can be seen in the table below.

Table 41. Siaya County Population

Sex	Number of persons	Percentage (%)
Male	471 669	47.49
Female	521 496	52.50
Intersex	18	0.01
Total	**993 183**	**100.00**

Source: KNBS 2019 Kenya Population and Housing Census

The county youth population stood at 313 496 (31.6 percent of county population) of which 146 231 (46.6 percent) were young men and 167 265 (53.4 percent) were young women as per the table below.

Table 42. Siaya youth (16–35 years) population

Sex	Number of persons	Percentage (%)
Male	146 231	46.6
Female	167 265	53.4
Total	**264 072**	**100.00**

Source: KNBS 2019 Kenya Population and Housing Census

3.1.3 Employment statistics

As per the KNBS 2019 Census, it is estimated that approximately 41.6 percent (412 919 persons) of the population in the County (total population is 993 165) were working, while 2.2 percent of the population (22 224 persons) were seeking jobs or no work was available and 56.2 percent of the population (558 022 persons) were outside the labour force. The levels of unemployment may be explained by limited number of employment opportunities combined with low uptake of self-employmentopportunities by locals driven by low access to affordable credit and a low entrepreneurship culture amongst locals. In this regard, the County Government had prioritized expansion of job opportunities especially for youth and women with efforts being directed towards creation of employment opportunities in the agricultural sector and mentorship for youth in agrientrepreneurship.

3.1.4 Status of agricultural activities in Siaya County

Crop production is a major contributor to food self-sufficiency and security in the county. In addition, it contributes to poverty reduction through employment creation and improvements in livelihoods. The main food crops grown in the county are maize, sorghum, beans, cassava and sweet potatoes. These are produced across all the six sub-counties, albeit with different intensities. Cash crops produced are mainly rice, sugarcane and groundnuts. Vegetables

produced in the County include; tomatoes, onions and kales while fruits are mangoes, avocados, pawpaw, bananas, oranges and watermelon. Some of the emerging crops in the County include: irrigated rice, palm oil, chilli, passion fruits and grain amaranth.

Livestock production in Siaya is a significant activity and most households keep livestock and this entails rearing of beef and dairy cattle, poultry, sheep, goats and pigs. Other animals like donkeys, rabbits, bees and emerging livestock (e.g. quails, ostriches, crocodiles, silk worms) are also raised. Livestock production also entails forage production. Animal husbandry practices are almost uniform across the county with most livestock species raised on extensive farming systeMs A few farmers have shifted to intensive animal farming methods, which have increased the yield of the various livestock products.

Fishing is the most significant agricultural activity in Siaya County. Fisheries in the County are two folds; capture fisheries from Lakes Victoria and Kanyaboli, and culture fisheries (aquaculture). The Siaya Waters of Lake Victoria directly employ 12,140 fishing crews operating 4,007 boats accounting for about 30 percent of the number of crews and 28 percent of fishing boats operating on the Kenyan side of the lake. In 2016, the county produced about 28.3 thousand metric tonnes of fish from Lakes Victoria and Kanyaboli valued at about 5.6 billion Kenya shillings based on ex vessel prices. The catch was dominated by silver cyprinid or "Omena' (38 percent), Nile Perch (36 percent), Tilapia (6 percent) and Catfish (2 percent). However, it was noted that fish catches from the lake had shown a downward trend, from 39 thousand metric tonnes in 2010 to about 28.3 thousand metric tonnes in the year 2016 and this called for more sustainable utilization of fisheries resources from the lake. The decline is due to overfishing and fish migration due to the effect of water hyacinth.

3.2 Value chain analysis of all prioritized VCs in Siaya County

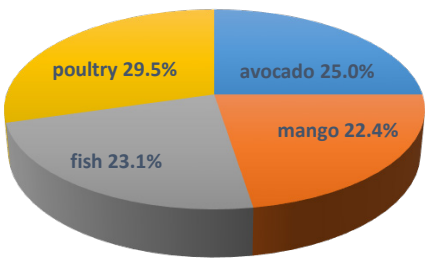
i) Description of youth current engagement in the core value chains

A total of 156 youth were interviewed comprising of 92 male and 64 female youth. The study found that 29.5 percent (n=46) of the youth engaged in the poultry VC, while 23.1 percent (n=36) were in fish VC, 22.4 percent (n=35) in mango VC and 25 percent (n=39) in avocado VC as per the table below. The detailed breakdown of gender and age-related data can be found in each respective section.

Table 43. Breakdown of youths interviewed per value chain

Value chain engaged	Gender		Total	Percentage (%)
	Male	Female		
Poultry	27	19	**46**	**29.5%**
Fish	19	17	**36**	**23.1%**
Mango	24	11	**35**	**22.4%**
Avocado	22	17	**39**	**25%**
Total	**92**	**64**	**156**	**100%**

Figure 20. Youth participation in the prioritized value chains in Siaya County



3.2.1 Poultry value chain

i) Brief description of the Poultry value chain structure

End Market: Just like in Kakamega County, it was difficult to obtain County specific data on the size of poultry demand in Siaya County. However, interviews with value chain actors revealed that there was a high demand for poultry, especially indigenous poultry farming in Siaya County. For example, according to an input supplier in the county, Hodari Agrovet, the increased demand was discerned from increase demand for poultry feeds and vaccines. For instance, weekly sales for vaccines for New Castle Disease (NCD) increased from from 200–300 doses in 2012 to 2 500 doses in 2017 and monthly sales of poultry feeds had also increased to 12–15 tonnes in 2017 from less than 1 tonne in 2012 (Galvmed, 2017). To cope with the increasing demand, local hatcheries with a capacity to hatch over 6 000 chicks have sprung up in the county. Besides, the market for poultry and poultry products is big ranging from households, hotels and eateries, schools and learning institutions, hospitals, retail shops and supermarkets. The deficit in production has seen increased importation of chicks and eggs from other counties such as Uasin Gishu, Trans Nzoia and also from Uganda.

Production: Poultry is commonly kept by most farmers in Siaya County, with farmers combining poultry production with other crop and livestock enterprises. There are three differentiated categories of producers of poultry in the County composed of individual households, producer groups and informal breeders. Commercial producers keep hybrid broilers and or layers and indigenous poultry that are raised under semi-intensive system, while producer groups and informal breeders mainly keep indigenous chicken. Indigenous chicken is quite popular with farmers because it matures faster (6 months) and most farmers who keep the improved indigenous chicken breeds operate on a small-scale rearing between 20 and 50 indigenous chicken per household, while medium scale farmers rear between 100 and 300 indigenous chicken per household.

Poultry feeding: It was found that improved poultry breeds were mainly fed on quality feeds while the indigenous chicken were left on free-range to scavenge and look for food, save for a few farmers who provided supplementary feeds which consisted of cereals and their brands like maize bran, sorghum bran, millet and kitchen waste. Chicks of up to 4 weeks were fed mostly on chick's mash from commercial millers, a mix of Kienyeji mash and own formulation of feeds by farmers. Growers were fed on grower's mash from commercial millers, Kienyeji mash and own feeds formulation. For mature hens, most farmers fed them with layers mash from commercial millers, Kienyeji mash and own formulations that included feeds such as the kitchen waste. It was noted that commercial feeds were expensive and was mainly preferred by farmers who wanted fast maturing birds. These feeds were however not cost effective for indigenous poultry as genetically these birds took long to mature and were not efficient feed converters like commercial broilers. Farmers therefore needed cost effective rations for indigenous chicken for the enterprise to be economically viable.

Disease management: This involved isolation of the sick birds from the healthy ones, use of antibiotics and consultations with livestock or veterinary officers in case the diseases became uncontrollable. Predation and illnesses were found to be the most common causes of mortalities when compared with external parasites, mismanagement and unknown causes. Discussions with experts from livestock department at the County revealed that Newcastle Disease, Fowl Pox and Gumboro were the most prevalent diseases affecting poultry farmers in the County. Most farmers involved both government and private animal health service providers to treat their animals while some farmers used local herbs during epidemics such as red pepper, neem and fresh leaves of aloe vera and lemon to treat sick birds. There were also groups that assisted farmers with vaccination of the birds at a cost of K Sh. 5 per bird.

Housing: Most of the households had built dedicated pens for their flock. On the other hand, some of the farmers kept the chicken in their houses with the chicken sleeping in one room of the house or in the kitchen.

Breeding: For the indigenous chicken, stock breeding was mainly left to chance hence no selective breeding was apparent or practiced. For the improved breeds, farmers tended to purchase high quality chicks hatched by hatcheries in the county.

Aggregation: It was noted that birds were sold after attaining maturity or achieving the desired weight and they were sold either live or dressed depending on customer preferences. Most of the chicken in the county were sold to middlemen who came from within and outside the county and who were the main players in this value chain node. The middlemen in turn sold chicken to urban based traders, hotels, institutions like hospitals and schools and to individual consumers.

Processing: Most of the respondents indicated they sold live chicken apart from a few, mostly youth who engaged in boiling and selling eggs in nearby centers.

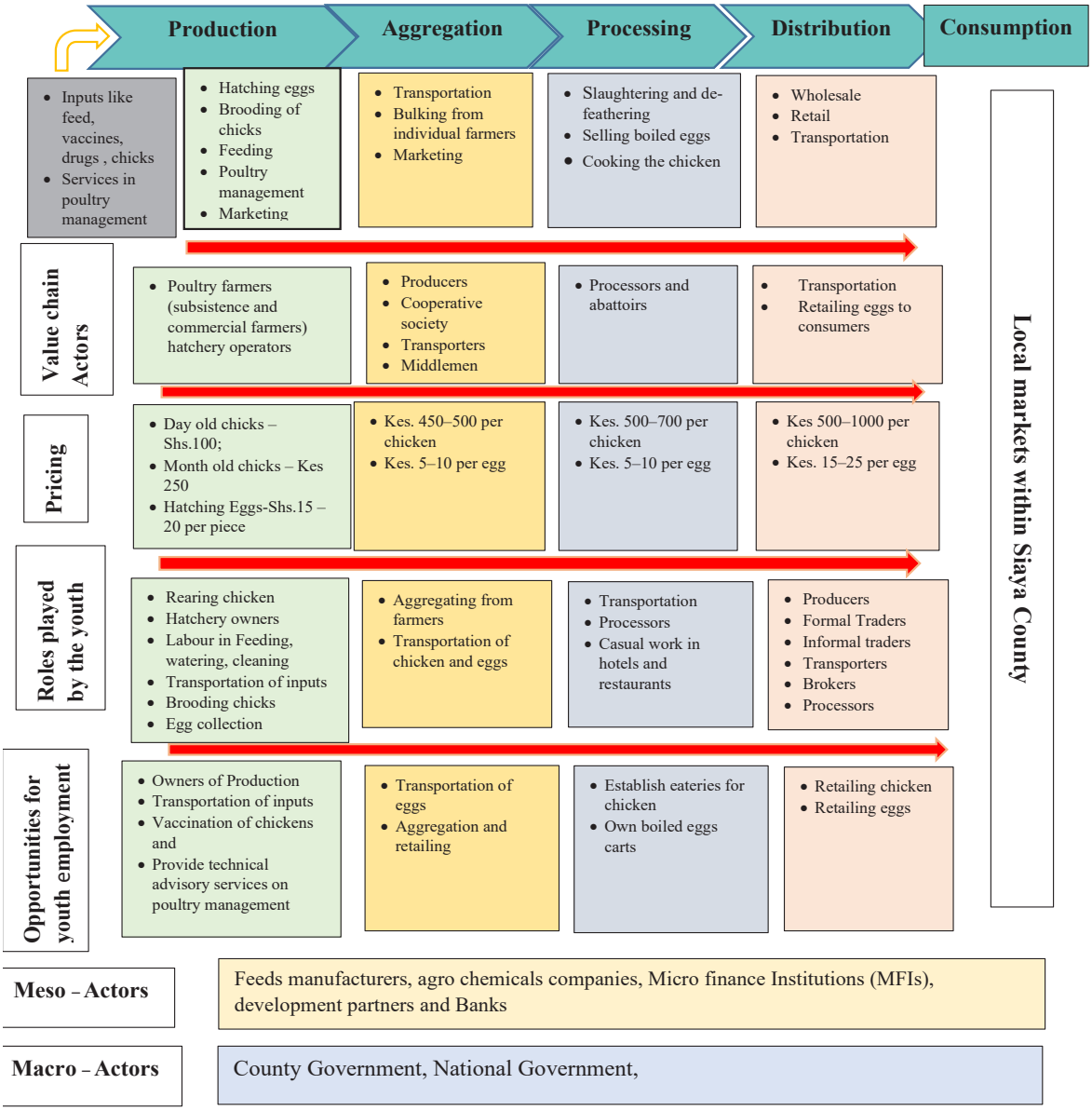
Distribution: Individual and group poultry keepers utilized three marketing nodes; at the farm gate, brokers either visiting on their own or when requested to come and buy chicken and selling to institutions. Farmers with large stock (More than 5 birds) sold directly to hotels, while those with a smaller stock (1–5 birds) sold to middlemen. Broilers were usually sold to hotels or supermarkets directly. Chicken prices varied by chicken size, season and sex. The price determination mechanism was not based on a set pricing scale but based on the "weighing' of chicken by lifting and assessing amount of flesh on chest of chicken. During harvest times, the prices were higher as a small proportion of households were willing to sell. This also coincided with the time when chicken were relatively healthy. The number of birds was high in the market during dry season and this also coincided with disease outbreaks and severe food scarcity. During such times chicken prices were very low.

Challenges facing the poultry value chain

- High cost of poultry feeds: farmers interviewed lamented on the high cost of chick mash, growers and layers mash which made the venture expensive to engage in.
- Diseases: farmers reported that diseases such as Newcastle, Fowl Pox and Gumboro were the major hindrances to achieving successful poultry enterprises.
- Low prices offered by middlemen for chicken and eggs.

ii) Poultry value chain map

Figure 21. Poultry value chain map for Siaya County



iii) Type of engagement of youth in the poultry VC

The study established that 29.5 percent (n=46) were engaged in poultry value chain. In terms of type of engagement in the different value chain nodes, 37 percent of youths were engaged at the production node, 17 percent were in aggregation, 15 percent were in processing, 17 percent in distribution and 13 percent were inputs suppliers as per the figure below. With reference to the different VC nodes, young men seem to be more represented in production, inputs supply and distribution, while young women dominate processing. Representation is balanced by gender in the aggregation node.

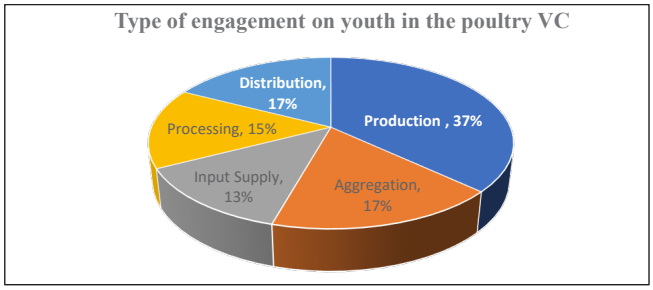


Figure 22. Type of engagement on youth in the poultry VC in Siaya County

iv) Level of youth engagement by employment status in the poultry VC in Siaya County

The study established that 65.2 percent of youth were engaged in the poultry VC as agripreneurs, 6.5 percent were engaged as casual workers, 4.4 percent contributed as family workers, 2.2 percent were in permanent employment and 4.4 percent were seasonal workers. With reference to the type of work engagement, young men seemed to be more represented among agripreneurs and as casual workers at 63.3 percent and 100 percent respectively with young women represented at 36.7 percent as agripreneurs as presented in the table below.

Table 44. Youth level of engagement by employment status in the poultry VC in Siaya County

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	19	63.3%	11	36.7%	30	65.2%
Casual worker	3	100%	0	0.0%	3	6.5%
Contributing family worker	1	50%	1	50%	2	4.4%
Permanent employee/wage worker	0	0.0%	1	100%	1	2.2%
Seasonal/part-time employee/wage worker	0	0.0%	2	100%	2	4.4%
Missing data	–	–	–	–	8	17.3%
Total	**–**	**–**	**–**	**–**	**46**	**100%**

The findings revealed that 58.7 percent of actors were male and 41.3 percent were female and of these actors, 2.2 percent were aged (16–17 years), 26.1 percent were aged (18–25 years), 47.9 percent were aged (26–30 years) and 23.9 percent were aged (31–35 years).

Table 45. Sex and age of youth Poultry VC actors in Siaya County

Type of Engagement	Gender			Age (Years)							
	Male (M)	Female (F)	Total	16–17		18–25		26–30		31–35	
				M	F	M	F	M	F	M	F
Production	12	5	17			4	1	7	1	1	3
Aggregation	4	4	8			1	–	3	3	–	1
Input Supply	5	1	6			1	–	3	1	1	–
Processimg	–	7	7			–	2	–	4	–	1
Distribution	6	2	8	–	1	3	–	–	–	3	1
Total	**27**	**19**	**46**	**0**	**1**	**9**	**3**	**13**	**9**	**5**	**6**
Percentage	**58.70%**	**41.30%**	**100%**	**0%**	**2.2%**	**19.6%**	**6.5%**	**28.3%**	**19.6%**	**10.9%**	**13%**

With regard to weekly incomes, it was established that 16 percent (n=38) of the youth in poultry VC earned a weekly income of up to K Sh.1 000, 18 percent a weekly income of between K Sh. 1 001 to 2 000, 13 percent a weekly income of between K Sh. 2 001 to 3 000, 16 percent a weekly income of between K Sh. 3 001 to 4 000, 18 percent earned an income of K Sh.4 001 to 5 000 per week, 8 percent earned an income of K Sh.5 001 to 10 000 per week and 11 percent earned an income of over K Sh.10 000 per week.

Table 46. Average weekly income for poultry value chain actors

Poultry VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001 – 2 000	2 001– 3 000	3 001 – 4 000	4 001 – 5 000	5 001 – 10 000	Over 10 000	Total
Agripreneur	6	6	3	4	5	3	3	**30**
Casual_worker	–	1	–	1	1	–	–	**3**
Contributing_family_worker	–	–	–	_	1	–	1	**2**
Permanent Employee	–	–	1	–	–	–	–	**1**
Seasonal/Parttime/ Wage worker	–	–	1	1	–	–	–	**2**
TOTAL	**6**	**7**	**5**	**6**	**7**	**3**	**4**	**38**
Percentage (%)	**16%**	**18%**	**13%**	**16%**	**18%**	**8%**	**11%**	**100%**

Regarding education attainment of VC actors, it was found that all actors had basic literacy skills having achieved a minimum of primary level education. It was found that 50 percent of producers had achieved secondary school education, 7.1 percent had attained post-secondary education and 42.9 percent had achieved college or university level education. For aggregators 14.3 percent had attained primary level education, 57.1 percent had achieved secondary school education, 14.3 percent had achieved post-secondary education and 14.3 percent had achieved college or university level education. For processors education achievement was; secondary level (20 percent), post-secondary (40.00 percent), and college or university level (40 percent). For distributors, education achievement was; secondary level (20 percent), post-secondary (20 percent), and college or university level (60 percent). For input suppliers, primary level (14.3 percent), secondary level (14.3 percent), post-secondary (14.3 percent) and college or university level (42.9 percent).

Table 47. Education attainment of poultry value chain actors in Siaya County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer		50%	7.1%	42.9%	100%
Aggregator	14.3%	57.1%	14.3%	14.3%	100%
Processor		20%	40%	40%	100%
Distributor	0%	20%	20%	60%	100%
Input supplier	14.3%	14.3%	14.3%	42.9%	100%

a) Youth current engagement in the production node

Type of engagement: This study found that most youth (37 percent) were engaged in the production node of the VC. The youths are engaged in rearing of chicks and live birds either individually or as a group. The study further established that 90 percent of the enterprise were owned by individuals while 10 percent were owned by groups. All individual-owned enterprises were not registered while the groups were registered and all had certificates of registration.

Level of engagement: 82.9 percent of youth were engaged in the production node as agripreneurs while 3.4 percent were employed as seasonal workers, 3.4 percent as casuals and 10.3 percent provided family labour. The key tasks performed by young men included construction and repairing of chicken pens, feeding of chicken, disease management and collection of eggs. For young women, the main tasks entailed cleaning of the chicken house, feeding of chicken, vaccination and disease management and selection and picking of eggs.

Table 48. Key tasks of young men and women in poultry production in Siaya County

Value chain node	Male tasks in poultry production	Female tasks in poultry production
Production	• Construction and repairing of chicken pens • Feeding of chicken • Disease management • Collection of eggs	• Cleaning of the chicken house; • Feeding of chicken • Vaccination and disease management • Selection and picking of eggs

The study found that most employees in the VC were hired workers on permanent terMs Employees were mainly hired through referrals from friends and relatives and they earned daily wages in the range of K Sh 150–250 or weekly earnings of K Sh 900–1 500 and no other benefits were available. Employees also worked without contracts. Agripreneurs earnings depended on the number of birds sold, trays of eggs and chicks sold per day. Those who sold chicks earned an average of 8 000 monthly. This was after deducting all expenses incurred in chick management. Those engaged in selling live birds made an average of K Sh 400 for each bird sold while those who sold eggs made an average of K Sh 5 per egg. For example, a group - Moyie Women Group - engaged in vaccination of birds earned K Sh 27 000 from vaccination of 11 000 birds per month. The birds were vaccinated against New Castle Disease and Gumboro. The charges were K Sh 5 per bird.

Challenges the youth faced in poultry production: It was noted that youth faced a number of challenges in poultry production some of which were stated as the following:

- **High cost of poultry feeds**: The youth interviewed lamented on the high cost of chick mash, growers' and layers mash hence making the venture expensive for them to engage in.
- **Inadequate funds to start and expand poultry enterprises**: Many youth cited lack of capital and difficulties in accessing capital to start poultry enterprises.
- **Low chicken prices offered by middlemen**. Exploitation by middlemen was a common challenge faced by youth working in the poultry VC.
- **Chicken diseases**: Youths reported incidences of chicken diseases such New Castle Disease (NCD) and Fowl Pox as one of the challenges faced in poultry enterprise.

Opportunities that the youth can leverage on: there exists a number of opportunities in the production node as follows.

- **Establishment of hatchery -** the stakeholders identified this one of the most viable opportunities for youth in the poultry value chain. This would entail purchasing of an incubator with capacity of 1 056 eggs hatching capacity. Since there was a good market for fertilized eggs, youth can buy the incubator for about K Sh 80 000 as a group. With a hatching cycle of 21 days, it means youth can make an average of K Sh 50 000 per month from this business by selling chicks at K Sh 100, assuming production costs of K Sh 50 per chick.
- **Offering vaccination services to poultry farmers** - chicken diseases were a challenge and it was also problematic to obtain quality and reliable vaccines. It is proposed that youths could be trained as community-based extension workers for management of chicken diseases such as New Castle Disease (NCD). Youth could offer vaccination services to the farmers at a fee of about K Sh 5 per bird.
- **Feed formulation** - Feeds were a major challenge in poultry production due to high costs of these inputs. This provided an opportunity for youth engagement in feeds formulation and also for youth to train farmers on feeds production. The study found that a market exists for poultry feeds and farmers would be willing to pay for training on feeds formulation since this would contribute to lowering costs of feeds.

- **Financial linkages**: There was need to link youth to financial institutions to access loans to start and expand poultry enterprises. In addition, there is need to train and organize youth around Village Savings and Loans Associations (VSLAs) to enable them create self-managed and self-capitalized savings groups that use members' savings to lend each other. According to VSL Associates, a group of independent practitioners working to spread the Village Savings and Loan (VSL) model, 89 percent of groups that have engaged in VSLA continue to operate longer than five years after receiving training. On average they double their capitalization and average loans sizes.

b) Youth current engagement in the aggregation node of the value chain

Type of engagement: From the study findings, 17 percent of the youth were engaged in aggregation. The youth travel to the villages to aggregate chicken from individual households. In most cases, urban based traders usually work with the youth who act as link between producers and end market traders.

Level of engagement: It was found that most aggregators were agripreneurs (87.5 percent) while 12.5 percent were employed mainly by aggregator cooperatives as casuals. Regarding key tasks performed by young men these mainly consisted of sourcing for the chicken and eggs in the villages, transportation of chicken to buyers and establishing linkages between buyers and producers, while tasks for young women consisted of sourcing for the chicken and eggs in the villages, egg collection for aggregators and establishing linkages between buyers and producers.

Table 49. Main tasks performed by young men and women in poultry aggregation in Siaya

Value chain node	Male tasks	Female tasks
Aggregation	• Sourcing for the chicken and eggs in the villages • Grading of chicken and eggs according to size and quality • Transportation of chicken to buyers • Establishing linkages between buyers and producers	• Sourcing for the chicken and eggs in the villages • Grading of chicken and eggs according to size and quality • Establishing linkages between buyers and producers

The study found that most actors at this node in the VC hired workers for less than three months. The employees were hired mainly on casual basis and they mainly worked without contracts. Employees were mainly hired through referrals from friends and relatives and on average these workers earned K Sh150–250 per day without any other benefits. Agripreneurs at this node were also divided into those engaged in selling live birds, eggs and one to three months old chicks. Those engaged in aggregating live birds sold the birds for K Sh 40 per bird mainly to traders, hotels and restaurants and earned gross margins of K Sh 50 per bird, egg agripreneurs earned an average of K Sh 5 per egg while those selling day-old-chicks earned an average of K Sh 10 per chick.

Youth Challenges in aggregation:

- Lack of capital and access to finance to purchase birds from farmers.
- Price competition from established aggregators and middlemen and competition from imported eggs from Uganda.

Opportunities that exist for the youth in the existing models or in establishing new models:

- **Group formation**: Youth engaged in aggregation can form marketing cooperatives/ Associations to enable aggregation of poultry for purposes of securing markets and better prices for poultry and eggs.

- **Financial linkages**: There was need to link youth to financial institutions to access loans to establish aggregation enterprises.

c) Youth current engagement in the processing node of the value chain

Type of engagement: From the study findings, 15 percent of respondents were engaged in poultry processing. Poultry processing in the county include slaughtering and de-feathering of poultry and boiling of eggs. Slaughtering was done upon customer request at a fee agreed by the buyer and seller (K Sh 100 on average).

Level of engagement: It was found that 83.3 percent of youth were engaged in processing as agripreneurs while 16.7 percent were employed on temporary basis. Youths both male and female were employed to carry out slaughtering and de-feathering of poultry and boiling of eggs in restaurants, hotels and other food eateries. Employment terms were mainly on temporary terms (3–6 months) and the youth earned daily wages in the range of K Sh 150–300. For youths employed to slaughter and defeather chicken the wages were K Sh 20–30 per live chicken. It was noted that these youth worked without contracts. However, for OSH youths were provided with protective clothing especially for that slaughtering chicken which is done manually. Chicken processors earned an average of Ksh 500 for the slaughtered chicken while those engaged in boiling eggs earned gross margins of K Sh 5 per boiled egg.

Table 50. Main tasks performed by young men and women in poultry processing in Siaya County

Value chain node	Male tasks	Female tasks
Processing	• Slaughtering and defeathering chicken • Dressing and packaging in khaki or polythene bags. • Boiling eggs	• Slaughtering and defeathering chicken • Dressing and packaging in khaki or polythene bags. • Boiling eggs

Youth Challenges in processing:

- Lack of capital and access to finance to establish food eateries or poultry processing enterprise.

Opportunities that the youth can leverage on

- **Cooking and selling of chicken products** such as boiled eggs, chicken biting. These could be sold on the streets and market places where there was busy human traffic;
- **Provision of slaughtering and de-feathering services**. Youth can engage in provision of slaughtering and de-feathering services.

d) Youth current engagement in the distribution node of the value chain

Type of engagement: It was noted that 17 percent of youth were engaged in the distribution of poultry and poultry products as traders or wholesalers. However, most youth were engaged as transporters of poultry products - chicken and eggs in this VC node.

Level of engagement: It was noted that most youth (85.7 percent) engaged in distribution were self-employed while 14.3 percent were employed to provide family labour. Youths mainly provided transport services using motorcycles and were paid based on distances covered. On average earnings from this engagement ranged Ksh 150–500 per day. The earnings of self-employed youth were based on the quantities transported and distances covered. On average, earnings reported were Ksh 500–700 per day. Tasks performed by male youth include transportation of chicken and eggs, doing sales of eggs and chicken on hand pushed carts and establishing linkages between producers and consumers. For young

women, the key tasks were sourcing for markets for chicken, eggs and one day-old chicks and making deliveries of chicken and eggs to customers.

Table 51. Key tasks performed by young men and women in poultry distribution in Siaya

Value chain node	Male tasks	Female tasks
Distribution	• Transportation of chicken and eggs • Doing sales of eggs and chicken products using hand pushed carts • Establishing linkages between producers and consumers	• Sourcing for markets for chicken, eggs and one day-old chicks, etc. • Making delivery of the chicken and eggs to customers while on foot or using other means of transportation

Youth challenges in distribution

- Low prices offered by traders and middlemen in the market place
- Egg price fluctuations due to influx of cheaply priced eggs from Uganda. It was noted that eggs from Uganda sold at about Ksh 5 per egg yet locally produced eggs sold at Ksh 10

Opportunities that the youth can leverage on

- Formation of marketing groups to pool resources together and gain from economies of scale thereby enjoying a better negotiating position in the market. Main markets for chicken include Siaya Municipal Market Akala and Aram Markets.
- Sensitization and mobilizing of farmers to produce fertilized eggs as they fetch higher prices in the market and can be used for hatching chicks.

e) Youth engagement in the extended value chain and in provision of support services in the poultry value chain

Provision of support services: it was observed that about 13 percent of youth were involved in providing support services in the value chain which included provision of inputs used in poultry production including chicken feeds (chick mash, layers mash growers mash), drugs and vaccines. Youth, who were organized in groups, were also involved in provision of vaccination services at a fee of K Sh 5 per bird to farmers. However, it was noted that very few youths were engaged in running agrovets as this type of business required a huge capital outlay.

Challenge's youth face in provision of support services in the extended value chain:

- Lack of capital and access to finance to establish inputs business such as agrovets;
- Lack of technical skills: many youths lacked technical skills necessary to provide support services in the poultry VC.

Opportunities available in provision of services in the extended value chain:

- Youths can establish partnerships with owners of chicken hatcheries to market and sell day-old-chicks. This business model would entail working with owners of hatcheries where youth obtain orders from farmers requiring day-old chicks and then working with hatchery owners, the youth place orders, collect and deliver the chicks to farmers as soon as the chicks as hatched. On average youth can make between K Sh 5–10 per chick for this service based on the distance covered.
- There was an opportunity for youth to provide vaccination and disease management services to farmers at a fee.

Occupational safety and health issues in the poultry value chain

- In general terms, working in the poultry value chain can carry serious health risks, including zoonoses and infectious diseases, exposure to agricultural dust and toxic gases, chemicals used at poultry farms (for disinfection, etc.). The work is often physically difficult and involves handling heavy loads, uncomfortable postures and movements. Activities considered more hazardous, especially for youth, include risk of accidents for young males engaged in distribution using motorcycles, drugs and vaccines contamination and dust during cleaning of poultry houses.
- Evidence of accidents - no evidence of accidents was reported during our interviews and discussions
- OSH measures adopted included; wearing protective gears (helmets and jackets) by the youth motorcycle riders, putting on masks during cleaning and disinfecting the houses and chicken.

3.2.2 Avocado value chain

i) Brief description of the Avocado value chain structure

End market: The national acreage under avocado has been increasing steadily. In 2015 the country wide acreage under avocado production was 13 305Ha. In 2020 the area under avocado was estimated to have surpassed 20 000Ha. Kenya has huge potential for avocado production from both small scale and large-scale farmers. Kenya is the world's third largest producer of avocados. It's also Kenya's leading fruit export, accounting for nearly one–fifth of its total horticultural exports. Kenya is also ranked eight globally (2.1 percent of market share) in 2019 in export of avocados shipping out 59 000 tonnes with annual value of Ksh 10.6 billion, behind Mexico, Netherlands, Peru, Spain, Chile, Colombia and the United States of America (FPEAK, 2020).

In Kenya, avocado is one of the most consumed fruits that is readily available in the market all year round. Going by the latest HCDA statistics, avocado has a fair share among the leading export crops and Kenya stands out as a major player in the avocado export market. Locally avocado is sold at the market place from between K Sh10 to KSh 50 depending on the size and quality. Avocado trees are very productive and can fruit all year round. At maximum production, a single mature tree can produce 70 to 100 kg of fruits per year. Kenya has witnessed a sharp increase in the number of countries interested in Kenya avocados, these counties are, The Russian Federation, Hong Kong, Singapore, Belgium, Germany, Netherlands, France, Spain, Islamic Republic of Iran , Libya, and Egypt among others. This is in addition to the in-country demand. According to the Avocado Society of Kenya, Siaya County is one of the counties where avocado farming especially the Hass variety for export is taking shape.

Production: Avocadoes in Siaya County are mainly grown by small-scale farmers, who grow them for subsistence and to sell in local markets and in the neighboring counties. From the study, it was observed that each household has on average of one or two avocado trees. Local varieties dominate the county's avocado production, constituting about 80 percent of total production, whereas the Hass variety, one of known improved avocado varieties that was suitable for export markets, comprised approximately 20 percent of local production.

Aggregation: the aggregation node provides important marketing channels for many small-scale avocado farmers who had small volumes which would be expensive to market individually. The actors in this node are middlemen or brokers who facilitate collection of fruits and become contact persons to other middlemen in their respective areas. They form the most important part of the current value chain in the county as they link production to the markets. Most farmers choose to work with the middlemen since they pay in cash at the farm gate for the avocado fruit.

Processing: The role played by processors is increasingly getting important as they take most of the fruit from the local market for processing. The processors sort fruit on maturity, process

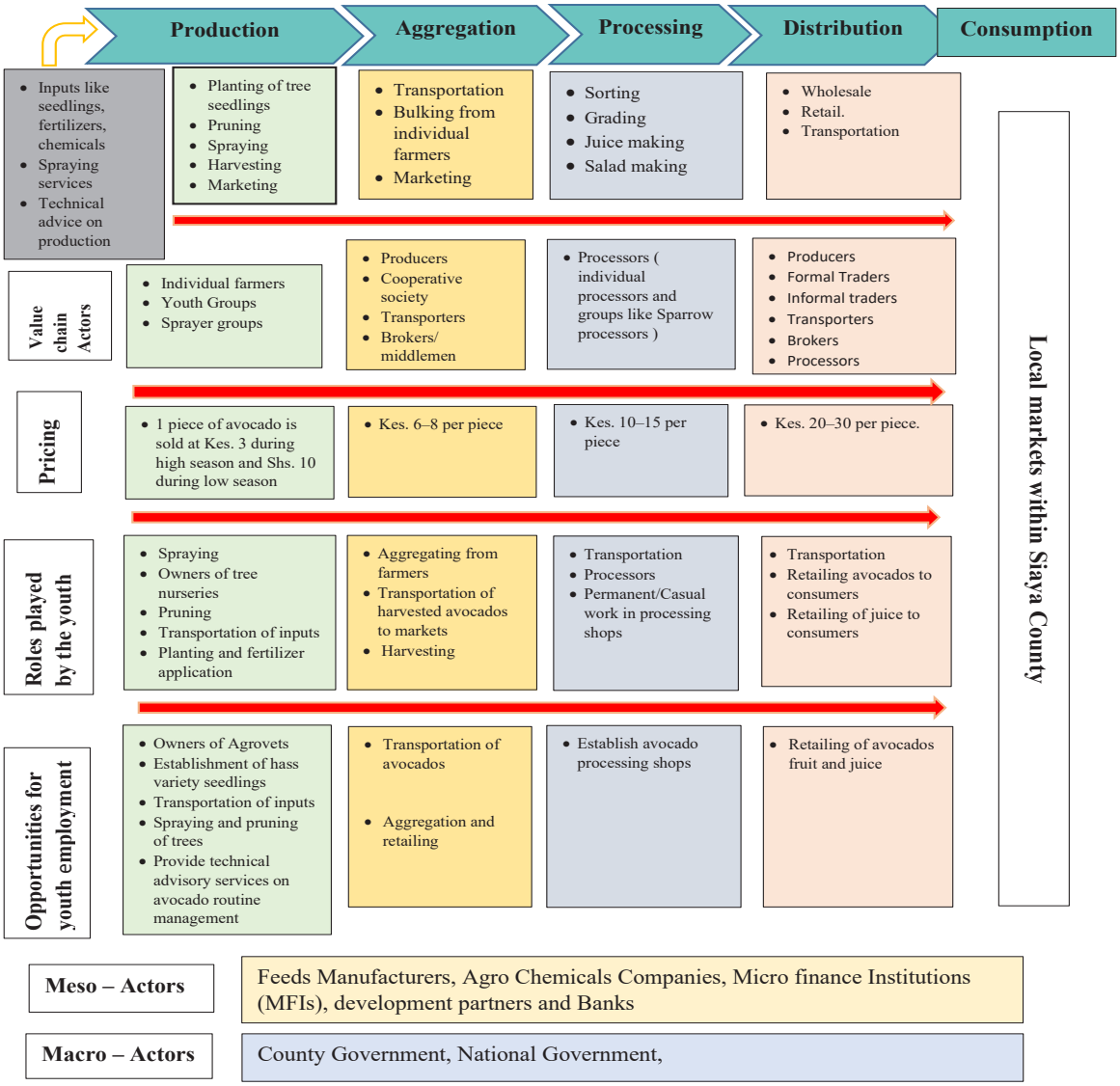
into fruit salad and avocado juice. There are two levels of value addition to avocado crop that are adopted in the county. The first level is to improve product image through sorting, grading and packaging and the second level is to process the fruit into other forms that have higher market value like fruit salads and juices. Avocado processing is done by individuals and youth groups.

Distribution: The following are the key players in avocado distribution in the county:

- **Wholesalers:** Wholesalers buy in bulk from brokers. They then distribute to urban and rural selling points, supermarkets and major markets. They also sell to retailers at K Sh. 50 per kg.
- **Retailers:** retailers normally buy from wholesalers and sell to consumers. They either operate small retail shops, kiosks and mini supermarkets.
- **Small informal retail Kiosks and** "mama mbogas"**:** these form the majority of the sales outlets in county and provide the majority of locals with fruit and vegetables on an informal basis. They will either operate on the road side or will move from home-to-home hawking and selling fruit on cash basis.
- **Consumers:** consumption of avocado fruits is both direct and indirect. The direct consumption is where the unprocessed fruits are taken as whole fruits for the range of markets whereas the indirect consumption is whereby the processed avocado oil is an ingredient in some consumer goods. The overall consumption of the fruit at national levels continues to grow year on year as the awareness and spending power grows. Tourism brings in close to a million visitors each year and all the hotels & lodge have avocados on their menus.
- **Transporters:** these are involved in transportation of avocados from the farms to the markets.

ii) Avocado value chain map

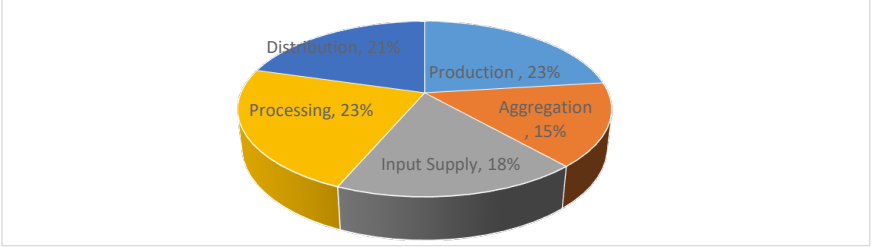
Figure 23. Avocado VC map for Siaya County



iii) Description of youth current engagement in the core value chain

The study established that 25 percent (n=39) of youth interviewed were engaged in the avocado VC, with 23 percent of youth engaged in avocado production, 15 percent in aggregation, 23 percent in processing, 21 percent in distribution and 18 percent in input supplies as per the figure below. In the sample, young men outnumber young women in all nodes, with the exception of processing where the engagement is gender–balanced and distribution which seems female dominated.

Figure 24. Type of youth engagement in the avocado VC in Siaya County



The study established that 48.7 percent of youth were engaged in the avocado VC as agripreneurs, 7.7 percent contributed as family workers, 5.1 percent were in permanent employment and 12.8 percent were seasonal workers. With reference to the type of work engagement, young women seemed to be more represented among agripreneurs and as contributing family workers at 52.6 percent and 66.7 percent respectively with young men represented at 47.4 percent as agripreneurs and at 33.3 percent as contributing family workers as presented in the table below.

Table 52. Youth level of engagement by employment status in the avocado VC in Siaya County

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	9	47.4%	10	52.7%	19	48.7%
Casual worker	0	0.0%	0	0.0%	0	0.0%
Contributing family worker	1	33.3%	2	66.7%	3	7.7%
Permanent employee/ wage worker	2	100%	0	0.0%	2	5.1%
Seasonal/part-timeemployee/wage worker	3	60%	2	40%	5	12.8%
Missing data	–	–	–	–	10	25.7%
Total	–	–	–	–	**39**	**100%**

The findings revealed that 56.41 percent of the actors were male and 43.59 percent were female and of these actors, 30.7 percent were aged 18–25 years, 18 percent were aged (26–30 years) and 51.3 percent (31–35 years).

Table 53. Sex and age of youth Avocado VC actors in Siaya County

Type of Engagement	Gender			Age (Years)							
	Male (M)	Female (F)	Total	16–17		18–25		26–30		31–35	
				M	F	M	F	M	F	M	F
Production	6	3	9			2	2	1	1	3	–
Aggregation	4	2	6			–	1	–	–	4	1
Input Supply	6	1	7			1	1	2	–	3	–
Processimg	4	5	9			2	2	–	2	2	1
Distribution	2	6	8	–	–	–	1	–	1	2	4
Total	**22**	**17**	**39**	**0**	**0**	**5**	**7**	**3**	**4**	**14**	**6**
Percentage	**56.41%**	**43.59%**	**100%**	**0%**	**0%**	**12.8%**	**17.9%**	**7.7%**	**10.3%**	**35.9%**	**15.4%**

With regard to weekly incomes, it was established that 17 percent (n=29) of the youth in avocado VC earned a weekly income of up to K Sh.1 000, 10 percent a weekly income of between K Sh. 1 001 to 2 000, 24 percent a weekly income of between K Sh. 2 001 to 3 000, 17 percent a weekly income of between K Sh. 3 001 to 4 000, 7 percent earned an income of K Sh.4 001 to 5 000 per week, 10 percent earned an income of K Sh.5 001 to 10 000 per week and 14 percent earned an income of over K Sh.10 000 per week.

Table 52. Average weekly income for avocado value chain actors

Avocado VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001 – 2 000	2 001– 3 000	3 001 – 4 000	4 001 – 5 000	5 001 – 10 000	Over 10 000	Total
Agripreneur	5	2	1	4	1	3	3	**19**
Contributing_ family_worker	–	1	2	–	–	–	–	**3**
Permanent Employee	–	–	–	–	1	–	1	**2**
Seasonal/Parttime/ Wage worker	–	–	4	1	–	–	–	**5**
TOTAL	**5**	**3**	**7**	**5**	**2**	**3**	**4**	**29**
Percentage (%)	**17%**	**10%**	**24%**	**17%**	**7%**	**10%**	**14%**	**100%**

Regarding education attainment of VC actors, it was found that all actors had basic literacy and numeracy skills having achieved a minimum of primary level education. It was found that 57.14 percent of producers had achieved secondary school education, 14.3 percent had attained post-secondary education and 28.58 percent had achieved college or university level education. For aggregators 50.0 percent had achieved secondary school education and 50.0 percent had achieved post-secondary education. For processors, 28.58 percent had achieved secondary school education, 14.28 percent had attained post-secondary education and 57.14 percent had achieved post-secondary education. For distributors, education achievement was; secondary level (75 percent) and post-secondary (25 percent). For input suppliers, primary level (16.7percent), secondary level (16.7percent), post-secondary (16.6 percent) and college or university level (50 percent).

Table 54. Education attainment of avocado value chain actors in Siaya County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer		57.14%	14.3%	28.58%	100%
Aggregator	0%	50%	50%		100%
Processor		28.58%	14.3%	57.14%	
Distributor	0%	75%	25%		100%
Input supplier	16.7%	16.7%	16.7%	50%	100%

a) Youth current engagement in the production node of the VC

Type of engagement: It was found that 23 percent of youth were engaged in the value chain as producers. The youth mainly carried out production activities such as taking care of the trees, spraying and harvesting of the fruits mainly as contributing family members since they do not own land.

Level of engagement: The study found that 42.9 percent of youth in avocado were self-employed, while 14.2 percent were seasonal workers, 14.2 percent were employed as casual workers and 42.9 percent provided family labour. Seasonal workers/ casuals were mainly employed during planting, manure application spraying and harvesting.

Employees earned daily wages in the range of K Sh 150–250 per day and no additional benefits were available and neither did they have contracts of employment. The respondents reported that verbal agreements were mainly used to hire and pay employees. It was also noted that due to the low production levels of avocado - most farmers had one or two trees-

employment levels were very low in this VC node. Self employed youth reported that the avocado trees belonged to the head of the household and therefore their task was to help in tending the trees and in marketing of harvested fruits on behalf of the family. These youth earned income from providing family labour in the range of K Sh 150–300 per day. The key tasks performed by young men included watering of trees, manure application, spraying of trees and harvesting fruits, while young women were involved in watering trees, manure application and cleaning, grading and sorting fruits.

Table 55. Key tasks of young men and women in avocado production in Siaya County

Value chain node	Male tasks in avocado production	Female tasks in avocado production
Production	• Watering of trees, • Manure application, • Spraying of trees and • Harvesting fruits • Transporting the fruits to the store or nearby markets.	• Watering of trees, • Manure application, • Spraying of trees and • Cleaning, grading and sorting fruits

Youth Challenges in production:

- Lack of land to plant avocado trees. Land in the county was ancestral and therefore youth had to wait until they were allocated by their parents. Most (95 percent) of the youth interviewed reported not to having a piece of land where they could plant avocados and they were mainly involved in tendering avocado trees on behalf of their parents.
- Inadequate supply of the improved varieties of tree seedlings - Hass variety. The demand for these tree seedlings was very high and supply was inadequate.
- Lack of information. Many farmers were not aware of the enormous opportunities available in the avocado VC and this contributed to low production of the fruits.
- High perishability of ripe avocado fruits leading to post harvest losses especially during the high season/glut.

Opportunities that the youth can leverage on:

- **Training of youth to be avocado seedling producers** and supply of tree seedlings for the Hass avocado variety. On average one avocado tree seedling sells for K Sh 150 and it takes and average of 4–6 months for the seedlings to be ready.[22]
- **Youth can also be engaged in providing services to avocado farmers** such as spraying services, application of pesticides, fungicides and herbicides. These services can be charged per tree. For example, spraying and prunning of one tree would costs K Sh 200 per tree, with a population of 150 trees in one acre youth can earn K Sh 30 000 per acre.

b) Youth current engagement in the aggregation node of the VC

Type of engagement: It was found that 15 percent of youth were engaged in the value chain as aggregators. The youth mainly carried out the aggregation function as transporters since they were riders of motorcycles especially young men.

Level of engagement: The study found that 50 percent of youth in avocado aggregation were self-employed, while 25 percent were seasonal workers and 25 percent provided family labour. Aggregation was mainly dominated by male youth who were riders of motor cycles used for avocado transport from producers to consumers. These motor cycle operators worked as individuals and the youth either owned or leased these motor cycles. It was also noted that

[22] Gross margin analysis for avocado tree nursery is presented in the appendices.

youth engaged in the aggregation role were paid based on the amount of fruit delivered to the market. Earnings were very low from this trade and ranged Ksh 100–250 per day and no additional benefits were available. It was noted that due to the low production levels of avocado, the aggregation function was not fully developed and therefore there were very few informal groups involved in avocado aggregation. The key tasks performed by young men included cleaning, grading and sorting fruits, avocado transportation and weighing as well as recording of fruits delivered to the market, while young women were involved in cleaning, grading and sorting fruits and weighing and recording of fruits delivered to the market.

It was noted that there were no producer groups in the County. Farmers were individually engaged in production and even sourced for market for their avocados individually. The avocados were sold based on the price agreed by both the buyer and seller. On the market side, there was no organization noted as each seller sold at a price that would best suite his or her interests. Prices were set based on the variety, size and quality of the avocados.

Table 56. Key tasks of young men and women in avocado aggregation in Siaya County

Value chain node	Male tasks in avocado production	Female tasks in avocado production
Aggregation	• Cleaning, grading and sorting fruits • Avocado transportation • Weighing and recording of fruits delivered to the market	• Cleaning, grading and sorting fruits • Weighing and recording of fruits delivered to the market

Youth Challenges in aggregation:

- Low supply of avocado fruit which made the aggregation role unviable. During the low season, aggregators are forced to source for the fruits outside the county so as to meet the demand in the county. The counties include Kisii, Nyamira, Kakamega and Bungoma. This makes them to increase the avocado prices during this period so as to cater for transport costs incurred.
- High perishability of ripe avocado fruits leading to losses especially during the high season.

Opportunities that the youth can leverage on:

- With high demand for avocado, youth can establish aggregation collection centres and buy avocado fruits from farmers and sell in market centres. One mature fruit can be bought from farmers at K Sh 5 and be sold in the local market at K Sh 10 thereby fetching gross margins of K Sh 5 per fruit. However, the aggregation business would also require the youth to establish a cold room to ensure the avocado fruit remains fresh before getting to the market.

c) Youth current engagement in the processing node of the value chain

Type of engagement: It was found that 23 percent of youth were engaged in the processing of avocado. Youth are engaged in processing activities in making avocado juice and fruit salads using avocado. Many (80 percent) of the fruit processing businesses were owned by the youth and were mainly done at small scale level. The equipment used were home category of blenders and the average number of avocados processed per day were 100. The reason given for this was the high perishability of the juice and the small capacity of the blenders.

Level of engagement: it was observed that 85.7 percent of youth were engaged in avocado fruit processing as agripreneurs while only 14.3 percent were employed mainly as seasonal workers. Youth in business mainly operated small stalls or "vibandas' and shops where they

carried out fruit processing making avocado juice and mixing of fruit salads using avocado and other fruits. These agripreneurs's ranged K Sh 300–600 per day from processing of 20 avocados per day. Youth employed in the processing mode were hired on casual basis and earned daily wages in the range of K Sh 150–300 per day without any other benefits. There were no written contracts between employers and employees and hiring was done verbally. The tasks for young men and women in processing were similar and consisted of cleaning, peeling, blending, and packaging, serving customers and distribution of the juice to clients on call.

Youth Challenges in processing

- High perishability of avocado juice which contributed to losses
- Seasonality of avocados leading to inconsistency in the processing of the juice
- There was limited processing capacity as a result of using home category of blenders instead of commercial blenders

Opportunities that the youth can leverage on

- Financial linkages to enable the youth business owners acquire commercial blenders and deep freezers to reduce spoilage and further meet the ever-growing demand for avocado juice.
- Youth can also be engaged in avocado value addition such as making of avocado juice. This type of business did not require heavy capital investments and had the capacity to generate gross margins of K Sh 27 500 per month.[23]

d) Youth current engagement in the distribution node of the value chain

Type of engagement: It was noted that 21 percent of youth were engaged in the distribution of avocados. The youth engaged in distribution were engaged as transporters who mainly used motorcycles and bicycles to ferry the fruit, as wholesalers and also retailers.

Level of engagement: It was observed that 57.1 percent of youth were engaged in avocado fruit distribution as agripreneurs while only 14.3 percent were employed as temporary workers, 14.3 percent as seasonal workers and 14.3 percent as casual workers. The youth working in distribution node were engaged in transporting, wholesaling and retailing. Transporters were paid based on the quantities of avocado delivered to the market and earned an average of K Sh 300–500 per day. Wholesalers and retailers earned an average of Ksh 900 and 1 200 per day respectively. Youths engaged as employees were paid daily wages in the range of Ksh 150–300 per day without any other benefits and no signed contract by the two parties. The tasks for young men consisted of transportation of fruits and selling of fruits in market places and urban centres while young women worked as fruit vendors.

Challenges the youth face in distribution

- Low prices offered for avocado fruits by traders and middlemen in market place
- High perishability of ripe avocado fruits leading to losses especially during the high season.
- Inadequate storage facilities leading to losses either through theft or spoilage as a result of poor post-harvest handling.

Opportunities that the youth can leverage on

- There was opportunity for youth to engage in trading of avocado fruits since the demand was high in the County.
- Provide transportation services: youth can provide services to traders and distributors

[23] Gross margin analysis of avocado juice processing is presented in the appendices.

using motor cycles. Gross margin analysis of the motor cycle business model established that youth can make a net profit of K Sh 4 000 per month from the business using a leased motor cycle or K Sh 3 100 per month using a purchased motor cycle.

e) Youth engagement in the extended value chain and in provision of support services in the avocado value chain

Provision of support services: it was observed that about 18 percent of youth were involved in providing support services to the value chain. These included provision of inputs and services such as spraying equipment and spraying chemicals, fertilizers and pruning of trees to improve productivity. The youth charged for the services at a rate of K Sh 200 per tree pruned and sprayed. The youth involved in spraying had organized themselves in groups and apportioned tasks to the members during spraying. These groups were registered and their daily operations were guided by the group constitutions. Some were involved in mixing chemicals, pruning, actual spraying and cleaning of equipment used after spraying. The groups earned on average K Sh 27 000–30 000 per month. The youth reported that the spraying business had enabled them improve their livelihoods. In addition, some youths were also involved in the production of local and Hass varieties seedlings.

Challenges youth face in provision of support services in the extended value chain:

- Youths who were engaged in spraying reported difficulties in spraying using the knapsack sprayers. They indicated that it was time and energy consuming compared to the motorized sprayer.
- Youth also reported lack of spraying gears, goggles, spraying gloves and overalls. They indicated that they were not locally available, and if they were, they were very expensive.

Opportunities available in provision of services in the extended value chain:

- There was need to provide financial linkages to youth to enable them to purchase motorized sprayers and spraying gears to ensure continuity of the business.
- Youth could also establish a business of hiring out of the sprayers to farmers who need the sprayers at a fee.

Occupational safety and health issues in the avocado value chain

- Workers in the avocado value chain face similar occupational risks that other field crop workers, due to the fact that they operate various machinery and tools, they are often subject to long working hours especially at harvest time, and are exposed to various chemicals.
- Activities considered more hazardous, especially for youth include risk of respiratory disease for youths engaged in spraying activities especially due to lack of spraying gears and protective clothing.
- Evidence of accidents: no major accidents was reported during interviews and discussions with VC actors.

3.2.3 Fish value chain

i) Current performance of fish VC

Fisheries activities are the major sources of income, food, employment and foreign exchange earnings in Siaya County. From the study findings, 38 percent of the respondents were directly engaged in the fish VC. Lake Victoria was the most important source of fish in the county. The lake was also important in conservation terms because of its great biodiversity of predominant fish species. Fisheries in the County were two folds; capture fisheries from Lakes Victoria and Kanyaboli and culture fisheries (aquaculture). There are 83 fish landing sites on Lake Victoria and 4 on Lake Kanyaboli with the major ones being Usenge, Wichlum, Luanda Kotieno, Osindo and Nambo on Lake Victoria. The catch from the lake was dominated by (Dagaa - 38 percent) and Nile Perch (36 percent) with Tilapia and catfish contributing 6

percent and 2 percent of the total fish landings by volume respectively. Other species were also landed though in relatively smaller quantities. It was noted that fish catches from the lake had shown a general downward trend, from 39 thousand metric tonnes in 2010 to about 28.3 thousand metric tonnes in the year 2016. This called for more efforts in ensuring sustainable utilization of the fisheries resources in Lake Victoria (Siaya County CIDP, 2018–2022).

Fishing in the county was done using wooden boats propelled mostly by sails or paddles and manned by owners or hired crews, using drift nets, seine nets, and long lines that were mainly set out overnight for those who fished in the lake. For those harvesting fish in the ponds, a seine net was normally used. Industrial fishing techniques was banned to protect both the livelihood of the fishing communities and the lake's fish stock levels. It was observed that due to over fishing in the lake, landed volumes of fish was on the decline. Further, fishermen, most of whom were young men, were forced to incur higher costs to go to deeper waters due to decreasing quantities of fish caught per trip.

ii) Brief description of the Fish value chain structure

End Market: The Eastern Africa region is projected to realize increased fish consumption from 4.80 kg in 2013 to 5.49 kg by 2022. Rising population growth and income levels imply that the region will need 2.49 million tonnes of fish to fill the demand-supply gaps (Sustainability, 2019). The 2019 budget policy statement, pegs local fish production at 180 000 tonnes a year against Kenya's "requirement of 500 000 tonnes. According to the 2018 economic survey, 188 000 tonnes of fish were consumed in 2017 derived from144 000 tonnes of freshwater fish, 23 tonnes of marine fish and 21 tonnes of pelagic fish were locally produced. Another 51 000 tonnes were imported Tilapia and frozen mackerel made up 85 percent of Kenya's 2016 fish imports, with 68 percent coming from China. Kenya also imports fish from Japan, South Korea, Uganda, United Republic of Tanzania, Viet Nam, Mauritius, Germany, Norway and South Africa. Kenya on the other hand exports fish and seafood to the European Union, United States of America, China and Japan. These include Nile perch, frozen octopus, lobsters, cuttlefish and prawns.

Siaya County despite producing fish still faces a huge deficit of fish to satisfy the local demand. This is because most of the fish harvested at the lake shores is first selected by fish exporters agents and only the sizes not fit for export remain for sale to the local market. As a result, the deficit is mitigated with imports from China and Busia County. There is therefore need to increase fish pond farming to increase supply to the local market.

Production: Fish production in the county was done at three levels: in the lake, fish ponds and using the cage fish farming. The youth were actively engaged in the three levels of fish production. The activities involved in production, especially in the pond and cage fish farming included production of fingerlings, restocking, feeding, predator control and harvesting. At the lake, the youth were mainly engaged in harvesting of fish from deep waters after which they were paid by the owners of the boats.

Aggregation: Aggregation of fish is unstructured and most of the aggregators are the middlemen and traders who collect the fish from the farmers. Farmers usually harvest on market days when the traders are ready and willing to buy the produce. The middlemen usually make prior arrangements with the farmers for the quantities required and on the day to make fish collection.

Processing: The processing of Nile perch and tilapia by industrial processors took place in modern facilities that were fully compliant with the food safety standards of export markets. Fish was filleted, packaged in labeled cartons or cans and either exported chilled by airplane or frozen by boat, depending on the fish quality and the pertinent orders.

In the domestic market, processing was artisanal and varied by the three main fish species. Tilapia which could be sold fresh in the markets was processed, salted, and smoke dried and deep fried. Silver cyprinid was usually sun dried at the surrounding areas of the landing sites and was not sold fresh. The processing was done in an unsophisticated manner which had little regard for food safety regulations. Silver cyprinid was bought by women traders who immediately sun-dried the fish near the beaches and then took it in bulk to the nearest

wholesale markets or to regional traders. Nile perch offal (skeletons, skins, etc.) were sold by the processors directly to local women who were specialized in processing this raw material (mostly frying).

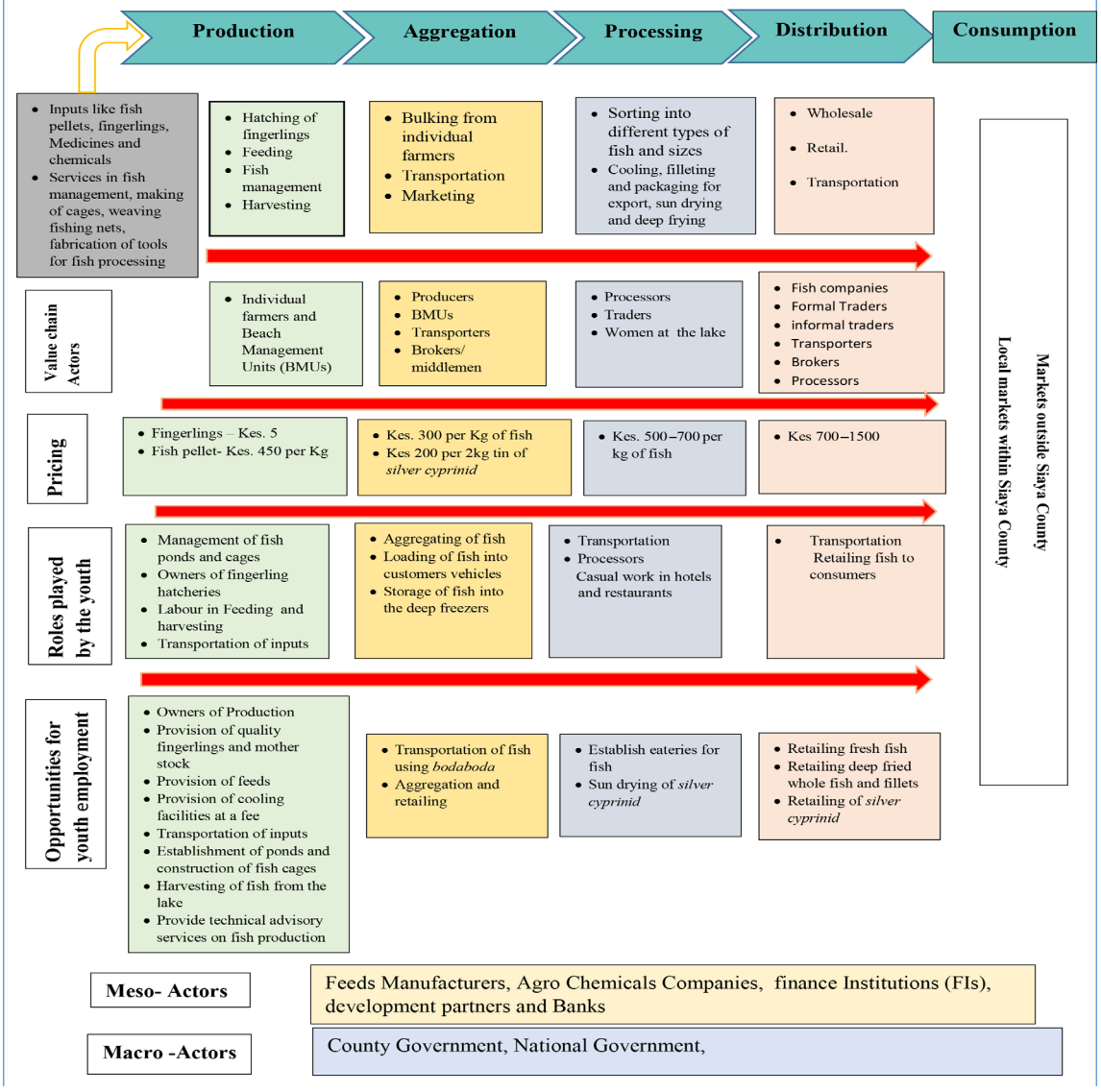
Distribution: The fish catch was sold directly on the beach to various traders either through the beach management units or individually. Industrial fish processor agents bought the fish (tilapia and nile perch) that met the processors' criteria (e.g. size, freshness) and was then loaded to the processors ice laden trucks. Lower quality grade Nile perch, tilapia and silver cyprinid were sold to a local middleman who included: collecting traders, regional traders, wholesalers and retailers. Most of the retailing took place in urban open air markets and through street venders. Sales of domestic fish products in modern retail outlets such as supermarkets was limited and only done by processors. Grading and the use of ice was minimal in these domestic end market channels, resulting in high spoilage levels. The average price per kg of fish sold was K Sh. 300.

Wholesale trade: For Nile perch, the final market segment was the export market. For Tilapia and silver cyprinid, these were sold to traders in the wholesale markets in and later to consumers within Siaya County and to other urban markets in the county and other markets such as Gikomba Market in Nairobi and Kongowea Market in Mombasa.

Retail trade: Tilapia, fresh and deep fried, silver cyprinid and other dried fish products were mainly sold to final consumers and other smaller outlets in urban centers.

iii) Fish value chain map

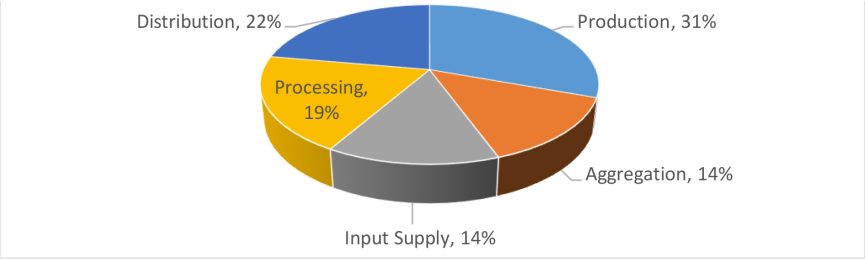
Figure 25. Fish value chain map for Siaya County



iv) Description of youth current engagement in the core value chain

The study found that 23 percent (n=36) of youth interviewed were engaged in the fish VC, with 31 percent of youth were engaged in production, 14 percent in aggregation, 19 percent in processing, 22 percent in distribution and 14 percent in inputs supply as per the figure below.

Figure 26. Type of youth engagement in the fish VC in Siaya County



The study established that 52.8 percent of youth were engaged in the fish VC as agripreneurs, 8.3 percent contributed as family workers, 5.6 percent were in permanent employment and 13.9 percent were seasonal workers. With reference to the type of work engagement, young women seem to be more represented among agripreneurs 63.2 percent compared to young men at 36.8 pecent. Young men were more represented at 66.7 percent as casual workers as compared to young women at 33.3 percent as presented in the table below.

Table 57. Youth level of engagement by employment status in the fish VC in Siaya County

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	7	36.8%	12	63.2%	19	52.8%
Casual worker	2	66.7%	1	33.3%	0	0.0%
Contributing family worker	1	100%	0	0.0%	3	8.3%
Permanent employee/ wage worker	2	100%	0	0.0%	2	5.6%
Seasonal/part-timeemployee/wage worker	0	0.0%	2	100%	5	13.9%
Missing data	–	–	–	–	9	19.4%
Total	–	–	–	–	**36**	**100%**

It was found that 52.78 percent of actors in the VC were male while 47.22 percent were female and the age categories for youth actors in the VC chain was 11.1 percent (16–17 years), 11.1 percent (18–25 years), 25 percent (26–30 years) and 52.8 percent (31–35 years). At least for the sample of this study, young men outnumbered women in the production and input supply node of the value chain, while young women were more represented in the processing node. Shares were more balanced for the other nodes.

Table 58. Sex and age of youth actors in the fish VC

Type of Engagement	Gender			Age (Years)							
	Male (M)	Female (F)	Total	16–17		18–25		26–30		31–35	
				M	F	M	F	M	F	M	F
Production	9	2	11	–	–	1	1	1	–	7	1
Aggregation	2	3	5	1	–	–	–	–	1	1	1
Input Supply	4	1	5	–	–	1	–	2	–	1	1
Processing	1	6	7	–	2	–	–	1	1	–	3
Distribution	3	5	8	1	–	–	1	–	3	2	1
Total	**19**	**17**	**36**	**2**	**2**	**2**	**2**	**4**	**5**	**11**	**8**
Percentage	**52.78%**	**47.22%**	**100%**	**5.6%**	**5.6%**	**5.6%**	**5.6%**	**11.1%**	**13.9%**	**30.6%**	**22.2%**

With regard to weekly incomes, it was established that 12 percent (n=26) of the youth in fish VC earned a weekly income of up to K Sh.1 000, 15 percent a weekly income of between K Sh. 1 001 to 2 000, 15 percent a weekly income of between K Sh. 2 001 to 3 000, 23 percent a weekly income of between K Sh. 3 001 to 4 000, 8 percent earned an income of K Sh.4 001 to 5 000 per week, 15 percent earned an income of K Sh.5 001 to 10 000 per week and 12 percent earned an income of over K Sh.10 000 per week.

Table 59. Average weekly income for fish value chain actors

Fish VC	Weekly income in K Sh							
Engagement type	0 – 1 000	1 001– 2 000	2 001– 3 000	3 001– 4 000	4 001– 5 000	5 001– 10 000	Over 10 000	Total
Agripreneur	3	3	1	4	2	3	3	**19**
Casual worker	–	–	2	–	–	–	–	**2**
Contributing family worker	–	–	–	–	–	1	–	**1**
Permanent Employee	–	1	–	1	–	–	–	**2**
Seasonal/Parttime/ Wage worker	–	–	1	1	–	–	–	**2**
TOTAL	**3**	**4**	**4**	**6**	**2**	**4**	**3**	**26**
Percentage (%)	**12%**	**15%**	**15%**	**23%**	**8%**	**15%**	**12%**	**100%**

Regarding education attainment of VC actors, it was found that 33.3 percent of producers had attained primary level education and 50 percent had achieved secondary school education. For aggregators 20 percent had attained primary level education and 80 percent had achieved secondary school education. For processors, 33.3 percent had attained primary level education and 50 percent had achieved secondary school education. For distributors, education achievement was; primary level (50 percent), secondary level (33.3 percent) and post-secondary (16.7 percent). For input suppliers, secondary level (25 percent), post-secondary (25 percent) and college or university level (50 percent).

Table 60. Education attainment of fish value chain actors in Siaya County

Value chain node	Education attainment				
	Primary	Secondary	Post-secondary	College or University	Total
Producer	33.3%	50%	16.7%		100%
Aggregator	20%	80%			100%
Processor	33.3%	50%	16.7%		100%
Distributor	50%	33.3%		16.7%	100%
Input supplier		25%	25%	50%	100%

a) Youth current engagement in input level node

It was found out that 11 percent of the youth were engaged in input supply node. The inputs supplied included fingerlings, mother stock and fish feed. Pacho fish farmers is a good example of a youth group engaged in provision of mother stock and fingerlings. "We stock 30 female fish and 10 in each pond. We currently have 1 600 mother stocks. These are mainly used for fingerling production hence making us the preferred source of mother stock and fingerlings in the county. This is because of the effort we put in proper feeding of the mother stock on hormones and feeds - George Onyango, Manager, Pacho Fish Farm. The average price of fingerlings is K Sh. 5 while that of the mother stock fish was reported to be K Sh 1 000 to 1 500. There were youth who were indirectly involved at this node in terms of labour provision in net weaving, cage construction and provision of net fabrication equipment.

Youth challenges in the extended value chain:

- High costs and non-availability of the inputs: fingerlings and fish feeds
- Getting the best breed of fingerlings is difficult since the existing few hatcheries were prioritizing the county's initiative of giving free fingerlings to farmers

Opportunities in the extended value chain:

- Training youth on feed formulation to improve availability of quality and affordable fish feeds and also create employment opportunities for the youth.
- Empower groups of youth through training to produce quality fingerlings and mother stock for fish farmers.

b) Youth current engagement in the production node

Type of engagement: it was found that 31 percent of youth were engaged in the fish production node. In the lake, young men were engaged on harvesting fish from deep waters, while in cage fish farming young men were involved in feeding, predator control and harvesting of fish. In fish ponds young men and young women were equally involved in fish feeding, production and restocking of fingerlings.

Level of engagement: It was noted that 81.8 percent of youth were engaged in production as entrepreneurs and the earnings were dependent on the fish catches-size and type of fish caught. Gross earnings from the lake were ranged between Ksh 20 000–50 000 monthly, while earnings from fish ponds and fish cages averaged K Sh 150 000–200 000 per season. It was noted that youth engaged in these businesses mainly as registered groups. On the other hand, 9.1 percent of actors were employed on temporary basis while another 9.1 percent were employed on casual terms of employment. Most of these employees were hired to carry out fish harvesting activities in the lake, to control fish predators and to feed fish in the cages and fish ponds and majority of these were young men. Earnings from employment ranged from Ksh 200–350 per day with benefits like protective clothing (reflector jackets and hand gloves) being offered.

Challenges facing youth in fish production

- Lack of fishing equipment and facilities: Many youths in the area usually access the lake with boats that are poorly constructed making it hard for them to access the deep waters of the lake where the number of fish was plenty. Further, lack of cooling facilities such as refrigerators to store fish was a major challenge leading to huge loses of fish not sold.
- Inadequate capital to start fish production: A huge capital outlay was required to establish a fish pond, purchase fingerlings, fish feeds and fishing gears like nets which most youths in the county were not able to raise.
- High cost of fish feeds: it was reported that the cost of fish feeds was very high which made fish production using fish ponds and caged fish farming expensive.
- Presence of fish predators leading to fish losses.
- Harassment by Ugandan police officers. Most of the fishermen in Lake Victoria reported harassment leading to a reduction in the fish caught and huge fines being levied by authorities on the Ugandan side of Lake Victoria.

Opportunities in the fish value chain

- Fish cage farming: This activity was considered most viable for youth in the production node of the value chain. There is an opportunity for youth to engage in cage fish farming by supporting them to acquire the equipment and materials used in the cage fish farming business. The construction cost for a fish cage with capacity for holding 2 000 fish is about K Sh 120 000. The gross margins for this type of business are about K Sh 180 000 for eight months.
- Youths can also be supported to establish fish ponds which costs about K Sh 60 000 to establish and which had earnings estimated at K Sh 129 500 for eight months.
- Financial linkages would be useful in funding the establishment of cage fish farming business and fish ponds and purchasing of fishing gears and cooling equipment.

c) Youth current engagement in the aggregation node of the value chain

Type of engagement: The study revealed that 14 percent of you were involved in fish aggregation. Youth provided services such as cooling facilities for fish after harvest and charged Ksh 5 per piece of fish stored in their deep freezers.

Level of engagement: It was noted that most youth (75 percent) in aggregation were self-employed and only 25 percent were in employment where they were hired mainly on casual basis. The employed youth earned an average of Ksh 150–250 per day with no other benefits available and with not contracts of employment. It was also found that male youth were mainly involved in fish transportation and fish storage activities while female youth were mainly engaged in the fish storage business. Self-employed youth were mainly engaged as motor cycle riders to transport fish produce from aggregators to the market and were paid based on the distance covered and amount of fish carried. On average these riders earned gross margins of K Sh 600–1 000 per day. Some youth owned the motorcycles while others hired the motorcycle at K Sh.300 per day.

Challenges facing the youth in aggregation:

- Overproduction and oversupply by members leading to fish spoilage as their small capacity deep freezers were not able to hold a large number of fish.
- Low fish prices offered by traders. Traders took advantage of the lack of refrigeration capacities and offered low prices for fish.

Opportunities that exist for youth aggregation:

- Establishment of fish aggregation cooperatives. Youth can establish aggregator

cooperatives which can buy fish from farmers and store the fish in a deep freezer prior to delivery of the fish to traders or to hotels and restaurants. This type of business has potential to generate returns in the range of K Sh 5 000 –10 000 per day.

- Youth can also be engaged in transportation of fish from farmers to traders and buyers using motorcycles.
- Financial linkages would be necessary to enable youth acquire deep freezers to hold more fish, reduce spoilage and consequently fetch better prices in the market.

d) Youth current engagement in the processing node of the value chain

Type of engagement: It was noted that 19 percent of youth participated in the processing of fish. Fish processing was predominantly a women activity and was mainly done at the shores of the lake.

Level of engagement: The study found that most youth (89.9 percent) were engaged in fish processing as self-employed individuals and only 11.1 percent of the youth were employed mainly as casuals in hotels and restaurants and at fish landing sites. On average employed youth were engaged on casual basis and earned daily wages of K Sh 200–400 with additional lunch benefit. However, these casuals lacked contracts of employment. On the other hand self-employed youth earned K Sh 800–1 000 per day. The main tasks carried out in processing was sun drying of fish at the landing sites especially the silver cyprinid locally known as "omena', which was not sold fresh and the salting, drying, smoking and deep frying of Tilapia. The processed fish was mainly bought by women traders and youth who sold it in the nearest market centers. It was noted that processing activity had a significant potential for job creation in the fish value chain.

Youth Challenges in processing

- Inadequate skill to process fish into fillet
- Inadequate funds to acquire fish processing equipment

Opportunities that the youth can leverage on

- Training of youth on fish value addition such as making of fish fingers, fish filleting, making fish samosas and cooking fried fish. These businesses have the capacity to generate an average of K Sh 150–450 per day for youth. Youth can also leverage on online marketing platforms for marketing of these value-added products processing would enable the youth to start processing fillets and this could create jobs and also improve earnings from fish processing
- Financial linkages to enable youth acquire fish processing equipment like deep friers, weighing machines

e) Youth current engagement in the distribution node of the value chain

Type of engagement: From the study findings, distribution was the most popular activity in the fish VC with 22 percent of youth engaged in distribution of fish. Youth were mainly contracted to transport and deliver fish from producers to fish traders and hotel owners. It was noted that the bulk of fish - Nile Perch, Tilapia and silver cyprinid - was purchased in bulk by traders and processors and youth were mainly involved through provision of transport using motorcycles. However, many youths also carried their own fish which they sold to consumers and traders.

Level of engagement: It was noted that 62.5 percent of youth participant in distribution were self-employed while 25 percent were employed on temporary or casual basis and 12.5 percent of the actors provided family labour. Youth agripreneurs earned income from transportation of fish which was based on distance covered and the number of Kgs of fish delivered and the average earnings from fish transported was K Sh 500. Means of distribution included human transport, wheelbarrows and motorcycles. Fish traders earned an average of Ksh 1 000–1 500 daily while hotel owners earned an average K Sh 2 000 daily. Youth employed as casuals,

carried out tasks such as working in hotels and food eateries that sold fish or in shops and stalls that sold fish. Earnings per day ranged from Ksh 150–300 per day with other benefits such as lunch. It was observed that the employees were provided with protective clothing like masks, aprons and uniforMs However, they were employed without contracts.

Challenges the youth face in distribution:

- Low prices of fish due to competition from imported fish especially coming from China;
- Lack of weighing scales for better price determination since weighing is done manually and through observation;
- Lack of storage services resulting to losses occasioned by fish rotting;

Opportunities that the youth can leverage on

- Provide transportation services with cooler boxes for better service and quality assurance.
- Investing in digital weighing scales to ensure proper weight determination and further set better prices guided by the weight of fish.

f) Youth engagement in the extended value chain

Provision of inputs: the main inputs used in the production of fish are fingerlings and fish feeds. It was found that youth were mainly involved in transportation of inputs from the suppliers to the farmers using motor cycles. This activity was predominantly carried out by young men. It was also established that youth were involved in weaving of fishing nets and making/repairing of fishing boats.

Challenges facing youths in the extended value chain:

- High costs and non-availability of the inputs: fingerlings and fish feeds;
- Getting the best breed of fingerlings is difficult since the existing few hatcheries were prioritizing the county's initiative of giving free fingerlings to farmers.

Opportunities in the extended value chain:

- Youth can establish feeds formulation enterprises to deliver fish feeds to farmers. For example, using locally available ingredients such as vegetable waste, grain chaff and powder made from small fish which are rich in protein and energy needed for fish growth. Feeds formulated at farm level can be sold at K Sh 150/Kg generating and can be packaged in 5, 10 or 20 Kgs bags for sale to fish farmers.

Other VC specific services: Other VC specific services include extension services and technical advisory services in fish farming. It was noted that there were very few extension officers, who were not able to visit and support all fish farmers and this provided an opportunity for youth especially those with a technical background in fisheries to provide extension services and technical advisory services to farmers at a fee.

Occupational safety and health issues in the fish value chain

- In general terms, working in fish farming can carry serious occupational risks, due to physical (ex. injuries due to falls, sting from fish spines or even snake bites), chemical (ex. due to water pollution or contamination), and biological (ex. due to parasites in the ponds) hazards. Activities considered more hazardous, especially for youth include risk of accidents for young males engaged in distribution using motorcycles, entry into the ponds during cleaning.
- No major accidents were reported during interviews and discussions with VC actors.
- OSH measures adopted included: wearing protective gears (helmets and jackets) by the youth motorcycle riders, pond management trainings to ensure proper construction of

the ponds with clear entries, proper cleaning of ponds and clearing of bushes to keep away rodents which are harmful to humans too.

3.2.4 Mango value chain

i) Current performance of mango VC

Mango is a significant and promising VC in Siaya County. There are an estimated 5 000 actors in this value chain who are segmented into five nodes: producers, aggregators, processors, distributors and input suppliers.

End market: Kenya accounts for 1 percent of global mango production. TechnoServe estimates Kenya's annual production to be between 400 000–500 000 metric tonnes with post-harvest losses being below 25 percent. 90 percent of mangoes in Kenya are sold in the informal markets "Vibanda'. Mango processors in the country operate at 30 percent capacity due to lack of raw materials. The prices of mangoes at processor level have risen by more than 80 percent in the last 7 years due to increased demand and low supply (Kilimonews, 2019). The mango market comprises numerous segments: fresh fruit, processed fruit for direct consumption (juices, dried mango, pickled mangoes) or fruit used in food preparations (chutneys, pastes, purees, flour, and mango slices in brine). Globally, 97 percent of mango production is consumed within the country in which it's grown, with roughly 3 percent entering the global export market. Only a small part (in the range of 1–2 percent) is for commercial processing and intended for international trade. Kenya's mango consumption follows a similar trend with 98 percent being consumed domestically and 2 percent exported (Jedele, 2003).

Mangoes have become an increasingly important fruit in the Kenyan diet, with the average Kenyan consuming an estimated 12.7 kg per year. There is a massive and increasing regional and global demand for mango juice and other processed products such as, dried mango confectionery products, green mango in brine or vinegar for processing, jams, preserves, chutneys and mango seed oil for cosmetics. However, there is insufficient processing capacity to enable local production to meet demand for value-added mango products, resulting in increased imports of mango pulp and juice to Kenya.

Production: In Siaya County the main varieties of mango produced are Apple, Tomi Artkins and Ngowe, followed by indigenous varieties. It was also found that on average farmers had 3–5 trees and production levels were low due to reliance on production of local varieties, poor crop husbandry and limited use of pesticides and fungicides. However, it was noted that the County Government had embarked on farmers' training to improve fruit yield. "Farmers and other value chain actors have been trained on crop husbandry with special focus on mango trees, pre and post-harvest handling, marketing and value addition. This had empowered them to produce high quality fruits and improve on marketing hence allowing for competitiveness". ASDSP Coordinator, Siaya County.

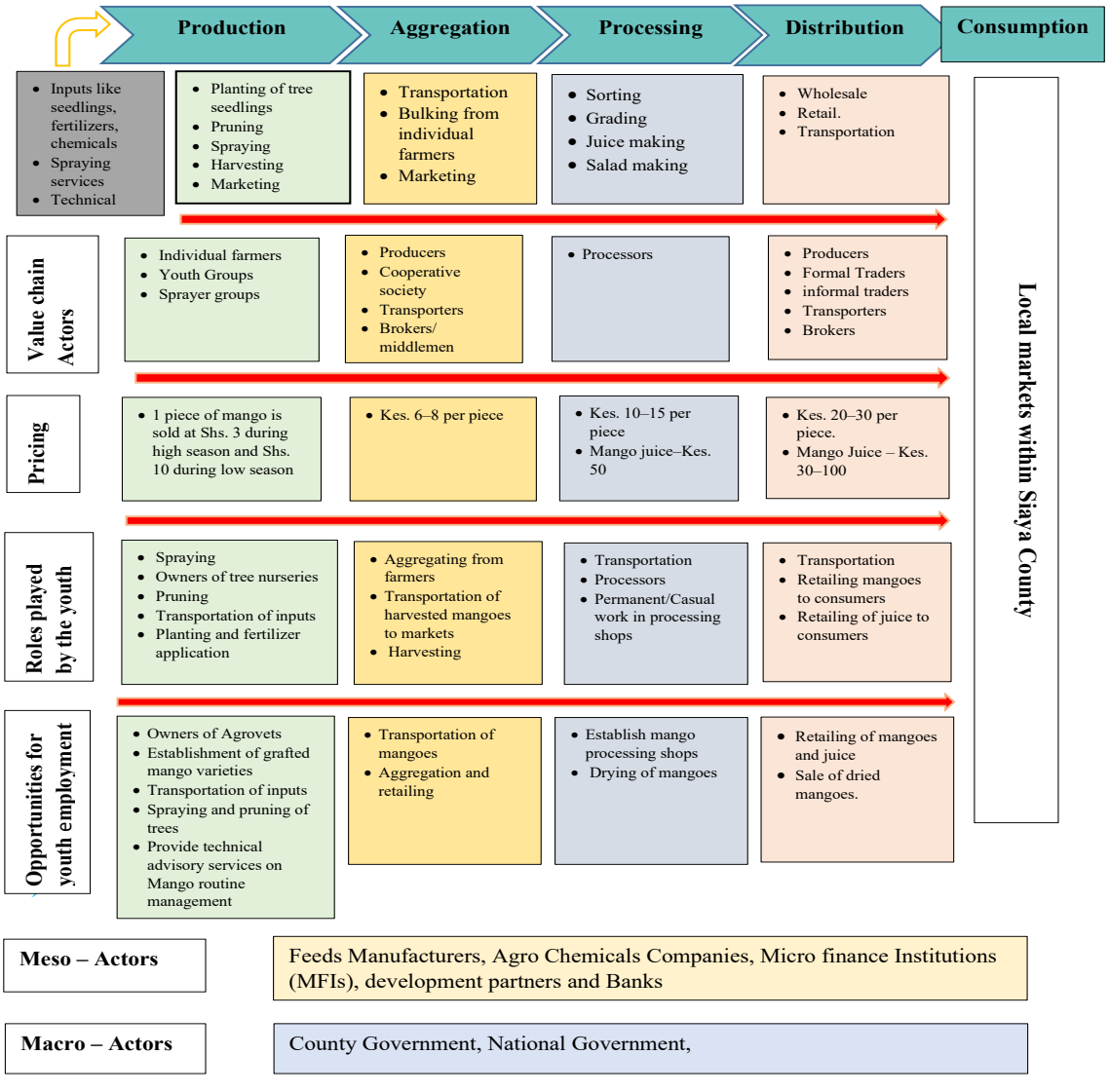
Processing: There are two levels of value addition to mango fruit adopted in the County. The first level is to improve the product image through sorting, grading and packaging and the second level is to process the fruit into other forms that have higher market value like fruit salads, mango syrup, dried mangoes and juices. Most of the processing was done by groups or mango cooperatives. For example, Ramba Fruit Producers and Marketing Cooperative located in Rarieda Sub-county, was one of the groups involved in processing of mango juice. The production capacity of the factory was 10 000 MT per month. However, the factory was currently processing 2 000 MT monthly. The most active months were between December and March. The main type of mangoes that were processed included ngowe and apple. The factory had been leased out to a local investor due to lack of management capacity by local farmers. Youth interviewed also reported mango dehydration as one of the initiatives introduced by FAO to help add value to the mangoes. "We have been introduced and trained on mango dehydration. We have also been linked to a buyer who will buy the dried mangoes. With financial support to purchase the equipment required for dehydration, we will be able to make money out of mangoes". Samuel Ochieng, Chairman, Urandi Youth Group.

Distribution: distribution of mangoes was carried out by traders and transporters. Traders

bought mangoes from farmers and sold to local markets in Boro, Ngiya, Ramba. It was noted that the County Government through ASDSP had trained farmers on packaging, record keeping and adding value to the mangoes. Transporters were involved in transportation of mangoes from farms to the markets or the processing factories using motor cycles, trucks and pick-ups and most of these means of transportation were owned by middlemen who are mainly nonn-youth. Youth mainly transported mangoes using motor cycles which were either owned or hired at a rate of K Sh 500 per day.

Input suppliers: a number of farmers were involved in supply of inputs especially tree seedlings. It was observed that input suppliers had been registered into an umbrella organization and had capacity to produce up to 120 000 seedlings per year. To cope with increased demand for the improved varieties (apple) of mango, input suppliers, especially the youth, had been trained on top working, a technique that is geared towards improving mango varieties in the county. As a result of the training, they were capable of producing the required seedlings to meet local demand. This offered small and large-scale mango farmers' an opportunity to earn more income from their mango trees through sale of mangoes and through value addition. "There are 68 seedling champions who are producing up to over 100 seedlings. Some produce seedlings of local mango variety and others improved varieties such as apple and Ngowe", ASDSP Coordinator, Siaya. Other input providers include sprayers who spray and prune mango trees at a fee of K Sh. 100 per tree sprayed. Further, besides the tree seedlings, there were other inputs such as pesticides, fertilizers and fungicides that were used by producers and were locally available in the agrovets.

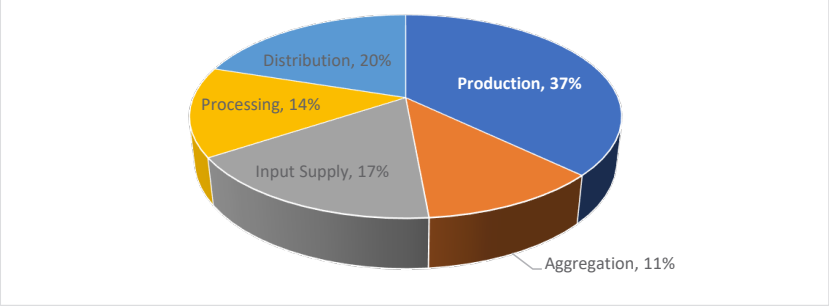
ii) Mango value chain map



iii) Description of youth current engagement in the core value chain

The study found that 22 percent (n=35) of youth interviewed were engaged in mango value chain, with 37 percent of youth being involved in mango production, 11 percent in aggregation, 14 percent in processing, 20 percent in distribution and 17 percent in inputs supply as per the figure below.

Figure 27. Type of youth engagement in the mango VC in Siaya County



The study established that 60 percent of youth were engaged in the mango VC as agripreneurs, 11.4 percent contributed as family workers, 2.9 percent were in permanent employment and 5.8 percent were seasonal workers. With reference to the type of work engagement, young men seem to be more represented among agripreneurs at 61.9 percent compared to young women at 38.1 pecent as presented in the table below.

Table 61. Youth level of engagement by employment status in the mango VC in Siaya County.

Level of engagement by employment status	Male		Female		Total	
	No	Percentage (%)	No	Percentage (%)	No	Percentage (%)
Agripreneur	13	61.9%	8	38.1%	21	60.0%
Casual worker	0	0.0%	0	0.0%	0	0.0%
Contributing family worker	2	50.0%	2	50.0%	4	11.4%
Permanent employee/wage worker	1	100%	0	0.0%	1	2.9%
Seasonal/part-timeemployee/ wage worker	2	100%	0	0.0%	2	5.8%
Missing data	–	–	–	–	7	19.9%
Total	–	–	–	–	**35**	**100%**

It was found that 68.57 percent of actors in the value chain were male and 31.43 percent were female. From these youth actors, 2.9 percent were aged 16–17 years, 28.5 percent were in the 18–25 age bracket, 31.5 percent were 26–30 years of age and 37.1 percent were aged 31–35 years. As shown in Table 59, males outnumbered women in production and input supply nodes, while women were more represented in distribution. Respective gender representation was more balanced in the other nodes.

Table 62. Sex and age of youth actors in the mango VC

Type of Engagement	Gender			Age (Years)							
	Male (M)	Female (F)	Total	16–17		18–25		26–30		31–35	
				M	F	M	F	M	F	M	F
Production	12	1	13	–	–	4	–	4	–	4	1
Aggregation	2	2	4	–	–	1	1	1	1	–	–

Input Supply	6	–	6	1	–	1	–	1	–	3	–
Processimg	2	3	5	–	–	–	3	1	–	1	–
Distribution	2	5	7	–	–	–	–	1	2	1	3
Total	**24**	**11**	**35**	**1**	–	**6**	**4**	**8**	**3**	**9**	**4**
Percentage	**68.57%**	**31.43%**	**100%**	**2.9%**	**0%**	**17.1%**	**11.4%**	**22.9%**	**8.6%**	**25.7%**	**11.4%**

With regard to weekly incomes, it was established that 25 percent (n=28) of the youth in mango VC earned a weekly income of up to K Sh.1 000, 14 percent a weekly income of between K Sh. 1 001 to 2 000, 18 percent a weekly income of between K Sh. 2 001 to 3 000, 14 percent a weekly income of between K Sh. 3 001 to 4 000, 14 percent earned an income of K Sh. 4 001 to 5 000 per week, 4 percent earned an income of K Sh. 5 001 to 10 000 per week and 11 percent earned an income of over K Sh.10 000 per week.

Table 63. Average weekly income for mango value chain actors

Mango VC	**Weekly income in K Sh**							
Engagement type	**0 – 1 000**	**1 001– 2 000**	**2 001– 3 000**	**3 001– 4 000**	**4 001– 5 000**	**5 001– 10 000**	**Over 10 000**	**Total**
Agripreneur	6	3	4	2	3	–	3	**21**
Contributing family worker	1	1	1	–	–	1	–	**4**
Permanent Employee	–	–	–	1	–	–	–	**1**
Seasonal/Parttime/ Wage worker	–	–	–	1	1	–	–	**2**
TOTAL	**7**	**4**	**5**	**4**	**4**	**1**	**3**	**28**
Percentage (%)	**25%**	**14%**	**18%**	**14%**	**14%**	**4%**	**11%**	**100%**

Regarding education accomplishment of VC actors, it was found that 30 percent of producers had achieved primary school education, 20 percent had realized secondary school education, 10 percent had attained post-secondary education and 40 percent had achieved college or university level education. For aggregators 75 had attained secondary level education, 25 percent had achieved college or university level education. For processors, 20 percent had achieved post-secondary school education and 80 percent had accomplished college or university level education. As for distributors, education achievement was; primary level (25 percent), secondary level (50 percent) and post-secondary (25 percent). For input suppliers, education achievement was; primary level (40 percent), secondary level (20 percent) and college or university level education (40 percent).

Table 64: Education attainment of mango value chain actors in Siaya County

	Education attainment				
Value chain node	**Primary**	**Secondary**	**Post-secondary**	**College or University**	**Total**
Producer	30%	20%	10%	40%	100%
Aggregator		75%	%	25%	100%
Processor			20%	80%	100%
Distributor	25%	50%	25%		100%
Input supplier	40%	20%	0%	40%	100%

a) Youth current engagement in the production node of the VC

Type of engagement: From the study findings, 37 percent of youth were engaged in mango

production. The youth both male and female carry out production activities - top working to improve the varieties, pruning, spraying and harvesting fruits - on behalf of their parents and proceeds from sale of the fruits was used to pay youth who participated in production.

Level of engagement: It was found that 63.6 percent of youth who were involved in mango production were self-employed, while 9.1 percent were employed on casual basis and 27.3 percent of the youth were engaged as family workers. It was observed several youth groups, that were formally registered, were involved in mango production. These groups mainly leased land for fruit production. These youth groups also employed youths who carried out tasks such as spraying, harvesting, and transportation of avocado. The employed youth were hired mainly as casuals and earned Ksh 150–250 per day with no other benefits available and had no contracts of employment. On the other hand, some youths were employed as family workers and in most cases these youth worked with no agreed payment terms from their parents.

Challenges the youth face in production

- Limited access to good quality planting materials: There was a general shortage of grafted planting materials of improved and higher yielding varieties in many parts of the county. Many youth farmers often used local seedlings which took long to bear fruit. Whereas grafted trees begin to bear fruit within 3 to 4 years, the local varieties took at least 5 years to bear fruit, depending on the growing conditions.

- Pest and disease challenges: Mangoes are affected by pests and diseases, which result in low yields or poor quality of harvested fruit. Major pests include the fruit fly, seed wevil and mealy bugs. Diseases like anthracnose and powdery mildew are common in almost all mango growing areas.

- Poor orchard management: It was noted that in many areas, mango trees were left to grow so big that pest and disease management, harvesting and other field operations were difficult to implement. Routine spraying and pruning were also not followed by many farmers.

- Post-harvest losses: Fruit damage is a common problem as a result of poor pest and disease management and the poor harvesting practices. Also, a lot of fruit is lost after harvest, especially during the peak seasons due to the limited capacity to store and process fruit. This is further worsened by the poor roads and transport infrastructure from farms to markets.

- Limited returns from mango production: Mango is highly seasonal and harvest was only expected at certain times of the year depending on the local conditions. During this time, most areas were harvesting and so the local markets would be saturated and, therefore, offer very low prices, which made the business not viable.

Opportunities that the youth can leverage on

- Training of youth to be mango seedling producers and supply of grafted tree seedlings of the apple, ngowe and kent variety. On average one mango tree seedling sells for K Sh 200.[24]

- Youth can also be engaged in providing services to mango farmers such as spraying services, application of pesticides, fungicides and herbicides. These services can be charged per tree. For example, spraying and pruning of one tree would costs K Sh 200 per tree, with a population of 150 trees in one acre youth can earn K Sh 30 000 per acre.[25]

b) Youth current engagement in the mango aggregation

[24] Gross margin analysis for mango tree nursery is presented in the appendices.
[25] Gross margin analysis for mango tree spraying is presented in the appendices.
[26] Gross margin analysis for motorcycle business is presented in the appendices.

Type of engagement: From the study findings, 11 percent of youth were engaged in mango aggregation. The youth mainly carried the aggregation as transporters using motorcycles and this was mainly done by young men.

Level of engagement: The study found that 42.8 percent of youth in mango aggregation were self-employed and 57.1 percent were in employment. Youth employed by aggregators were employed on casual basis and paid daily wages of Ksh 150–300 with no extra benefits. There were also no written contracts between employers and employees. The key tasks performed by young men included cleaning, grading and sorting fruits, mango transportation and weighing and recording of fruits delivered to the collection centres, while young women were involved in cleaning, grading and sorting fruits and weighing and recording of fruits delivered to the collection centres.

Youth involved in aggregation carried out tasks which entailed buying of mango from individual farmers and groups, bulking and transportation to markets and collection centers and selling to wholesalers, retailers and final consumers. Transportation of mangoes from farmers to collection centres and markets was dominated by male youth who used motor cycles. The motorcycles used were either hired or owned by the youth. On average aggregators made an income in the range of K Sh 500–1 000 per day individually.[26]

Challenges the youth face in aggregation:

- Limited access to produce during low seasons
- Low market prices during glut periods making the business unviable.
- Pest and disease challenges which led to spoilage of fruits and low quality of produce.
- Lack of storage facilities for mangoes in different market further leading to losses.

Opportunities that the youth can leverage on:

- With high demand for mango, youth can establish aggregation collection centres and buy mango fruits from farmers and sell in market centres.
- Youth can also establish tree nurseries for planting of mango seeds to produce tree seedlings for sale for apple, ngowe and kent mango varieties. The tree seedlings sell at K Sh 150 per seedling and have the potential earn gross margins[27] of K Sh 135 675 in three months.

c) Youth current engagement in the mango processing

Type of engagement: From the study findings, 14 percent of youth were engaged in mango processing. The processing methods included making of mango juice, fruit salads and even production of mango wine.

Level of engagement: it was established that 40 percent of youth in this VC node were self-employed while 60 percent were employed on casual labour basis. Youth who were self-employed had established small-scale businesses that carried out mango processing to make mango juice and also to mix fruit salad using mango and other fruits blended together. Many of these businesses were individually owned while some of the businesses were run by youth groups. The businesses were licensed and had registration certificates. On average, the businesses employed 1–2 employees to assist in the day-to-day running of the business. The employees performed tasks such mango cleaning, peeling, blending, packaging and serving customers and clients. The employees earned daily wages ranging from K Sh 200–300 per day and were employed on casual basis without contracts. Business owners on the other hand made gross margins of K Sh 1 000 –1 200 per day.

Challenges or limitations the youth face in mango processing:

- High perishability of mango juice which at times contributed to losses
- Some mangoes being of low quality thereby having low sugar content or limited ability to make high quality juice

- There was limited processing capacity as a result of using home category of blenders instead of commercial blenders;
- Poor product development which affected the shelf life of the products processed;
- Seasonality of the fruit which meant there were in business only during the peak season;

Opportunities that the youth can leverage on in mango processing

- Youth can engage in mango value addition and processing to make mango juice which can also be mixed with other fruits to make cocktail juice. There is also opportunity for making of fruit salads. It was established that mango processing and value addition has the potential to generate gross margins[28] of K Sh 1 000 per day for youth entrepreneurs.
- Financial linkages to enable the youth business owners acquire commercial blenders and deep freezers to reduce spoilage and further meet the high demand for mango juice.

a) Youth current engagement in the mango distribution

Type of engagement: It was observed that 20 percent of youth were engaged in mango distribution. The youth engaged in distribution were engaged as transporters who mainly used motorcycles and bicycles to ferry the mango fruit.

Level of engagement: it was noted that 42.9 percent of youth were engaged in mango distribution as agripreneurs while only 57.1 percent were employed as casual workers. Most youth working in distribution were engaged as transporters where they were paid based on the distance covered and the amount of fruit delivered to the market. Some youth also operated small scale businesses of fruit vending mainly in the market centres and these youth also employed their peers. Earnings for transporters averaged K Sh 700 per day, while wholesalers and retailers took home K Sh 1 500 and K Sh 800 per day respectively. These businesses employed one person on average, while during periods of glut period they would increase employees to 2 or 3 youth. Youth employed, though without contracts, were paid daily wages in the range of K Sh 150–300 per day without any other benefits. The tasks for young men consisted of transportation of fruits and selling of fruits in market places and urban centres while young women worked mainly as fruit sellers in the markets and urban centres.

Challenges the youth face in distribution

- Low prices offered for mango fruits in the market.
- High perishability of ripe mango fruits leading to losses especially during the high season.
- Some mangoes being of low quality thereby having low sugar content or limited ability to make high quality juice
- Inadequate storage facilities to store the mangoes as they await distribution.

Opportunities that the youth can leverage on

- Formation of marketing groups to enable youth pool resources for establishing mango collection/ storage centers and to increase the bargaining power in the market.
- Youth can also be supported to establish motor cycle transportation business.

e) Youth engagement in the extended value chain and in provision of support services in the mango value chain

Provision of support services: it was observed that about 17 percent of youth were involved in providing support services to the value chain. These included provision of inputs and

[27] Gross margin analysis for mango tree seedlings production is presented in the appendices.
[28] Gross margins analysis for mango juice making is presented in the appendices.

services such as spraying equipment and chemicals and pruning and top working of trees to improve productivity. The youth charged service charges of Ksh 200 per tree pruned and sprayed. The youth in this node were in groups, registered by the Ministry of Social Services and carrying out business by themselves. One of the youth groups, Uradi Youth Group, had received training on pruning and top working sponsored by Agrochemical Association of Kenya making top working the main economic activity of the group. The group charged of K Sh 300 per tree pruned and sprayed. This business was mainly carried out as a group and the groups were formally registered. Some other groups were involved in the production of local and improved mango seedlings varieties like apple and kent and sold these seedlings at an average price of K Sh 150.

Challenges youth face in provision of support services in the extended value chain:

- Youths who were engaged in spraying reported difficulties in spraying using the knapsack sprayers. They indicated that it was time and energy consuming compared to the motorized sprayer.
- Youth also reported lack of spraying gears-goggles, spraying gloves and overalls. The required gears were not locally available and if they were, their prices were too high for the youth to afford hence using substandard gears posing great danger to their health.

Opportunities available in provision of services in the extended value chain:

- Youth can also establish tree nurseries for planting of mango seeds to produce tree seedlings for sale for apple, ngowe and kent mango varieties.
- There was need to provide financial linkages to youth to enable them to purchase motorized sprayers and spraying gears to ensure continuity of the business.

Occupational safety and health issues in the mango value chain

- Workers in the mango value chain face similar occupational risks that other field crop workers, due to the fact that they operate various machinery and tools, they are often subject to long working hours especially at harvest time, and are exposed to various chemicals.
- Activities considered more hazardous, especially for youth include risk of respiratory disease for youths engaged in spraying activities especially due to lack of spraying gears and protective clothing.
- Evidence of accidents: no major accidents was reported during interviews and discussions with VC actors.

3.3 Access to finance by youth in Siaya

3.3.1 Providers of financial services, location and accessibility

This study found that there exists a number of diverse providers of financial services providers in Siaya County.

i) Commercial banks

Commercial banks are the major providers of financial services. It was found that there are five Commercial banks with operations in Siaya County which are Cooperative Bank of Kenya, Equity Bank, KCB Bank Limited and Postbank. These banks have branches in Siaya and Bondo and also in Ugunja.

ii) Micro Finance Institutions (MFIs)

It was found that MFIs were mainly located in Siaya, Bondo, Ugunja and Gem. The main MFIs include; Kenya Women Finance Trust (KWFT) and Faulu Kenya.

iii) Digital providers of money services

It was established that commercial banks and MFIs within the County had established digital financial services products such as KCB Mbenki, Equitel Money and Cooperative Bank MCo-op Cash. Other providers of digital financial services include; Safaricom Fuliza, Timiza, Tala, Branch and Okash amongst others.

iv) Government agencies

A number of Government agencies were also providing financial services. Most of these institutions were based at the county headquarters in Siaya town and these include: Agricultural Finance Corporation (AFC); Kenya Industrial Estates (KIE); Youth Enterprise Development Fund (YEDF); Women Enterprise Fund (WEF); Uwezo Fund; Kenya Climate Smart Agriculture Programme (KCSAP); and Agriculture's Agricultural Sector Development Support Programme II (ASDSP).

v) Non-banking financial institutions

This study established that there were a number of non-banking financial services providers in the county and these included SACCOs that offered FOSA services, mobile money agents and VSLAs. SACCOs with FOSA services included; Taraji SACCO and ROSCA amongst others. These SACCOS have operations in Siaya, Bondo and Ugunja Town. It was found that there are numerous mobile money agents and other bank agents offering finance services spread across the whole county. VSLAs were also in operation across all sub-counties in Siaya County.

vi) Informal providers of financial services

A number of informal financial services were identified during the study. These are; Chamas, merry go rounds, Table-banking, Shylocks amongst others. Though the funds available were sometimes unreliable and expensive, these sources of finance were preferred due to the ease of accessing the financial services.

vii) Insurance companies

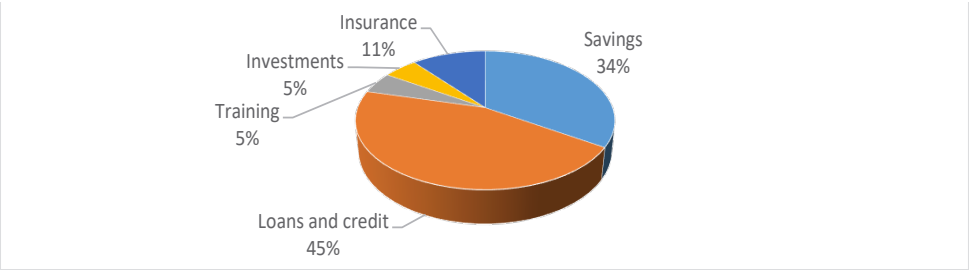
There are a number of insurance companies with satellite offices in Siaya County identified during the study. These include Madison Insurance, CIC Insurance, Jubilee, APA Insurance and AMACO Insurance. These insurance companies also work with brokers and agents based in the Siaya, Bondo and Ugunja Towns.

3.3.2 Demand for financial services by the youth in Siaya County

a) Usage of and type of financial services used from formal financial institutions

The study established that the financial services youth sought from formal financial institutions were loans and credit (45 percent), savings products (34 percent), insurance (11 percent), training (5 percent) and investments (5 percent).

Figure 28. Most sought after financial services from financial institutions in Siaya



For example, the study found that from among the active loan accounts at the Agricultural Finance Corporation (AFC) Siaya branch, an estimated 7 percent of K Sh 33 million loan portfolio to actors in three VC Fish, Mango and Poultry were young people. It was also noted that 17 percent of loans in the fish VC were to youth entrepreneurs while 4 percent of loans in the poultry VC were to young people.

Table 65. AFC Siaya Branch loan portfolio to Mango, Fish and Poultry VC

AFC Siaya Branch, Active agricultural value chain lending - Oct 2020					
Value Chain	**Lending (Shs) Million**	**Youth**	**Non-Youth**	**Men %**	**Women %**
Mango	5.0	0%	100%	65	35
Fish	20.0	17%	83%	65	35
Poultry	8.0	4%	96%	–	–

Source: AFC Siaya Branch

The study established that youth faced a number of challenges in accessing financial services and these related to: High cost of credit (73 percent), perceived risk of use (71 percent), lack of collateral (65 percent), limited awareness of financial services products (51 percent), limited accessibility of services (33 percent) and other challenges (11percent) such as fear of being repossessed in case of loan default and limited number of financial services products suitable for young agripreneurs.

Table 66. Challenges faced by youth in accessing financial services from formal financial institutions in Siaya

Type of Products	**Cost of credit is high**	**Perceived risk of use**	**Lack of collateral**	**Lack of awareness**	**Location being far and not accessible**	**Others**
Percentage (%)	73%	71%	65%	51%	33%	11%

The study further established that out of 122 youths interviewed using the youth specific questionnaire, 38 youths (26 male and 12 female), had requested for credit from the formal financial institutions with 7 out of the 12 young women, that is 58 percent of the young women confirming their request was successful and 17 out of 26, 65.4 percent of the young men's request being successful.

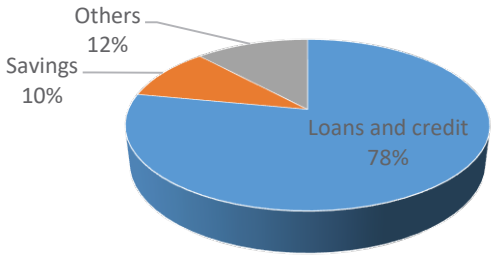
Table 67. Level of youth access to credit from the formal financial institutions in Siaya

	Have ever asked for a credit from a formal financial institution?			**Were you successful in your request?**		
Response	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Yes	**26**	**12**	**38**	**17**	**7**	**24**
No	**42**	**42**	**84**	**9**	**5**	**14**
Total	**68**	**54**	**122**	**26**	**12**	**38**

b) Usage of and type of financial services used from digital financial services providers

This study found that youth utilized financial services from digital financial services providers such as Tala, Branch, KCB Mbenki, Mshwari, Fuliza, Mkopa, Mkash etc. The main type of service sought from these institutions were loans and credit facilities (78 percent); savings (10 percent) and other services (12 percent) such as payment of bills etc.

Figure 29. Main type of financial services sought from digital financial services providers



On the type of financial products that youth wished to see provided by these institutions the following was identified: Increased loan limits with lower interest rates; Insurance products and services; Online training services on financial literacy and management; and investment products and services.

c) Usage of and type of financial services sought from informal institutions

It was found that youth utilized financial services from informal financial institutions such as merry go rounds, table banking groups, shylocks and Village Savings and Loans Associations (VSLAs). The type of services sought included: loans and credit (49 percent); savings (25 percent); training services (11percent); investments (5 percent); insurance (3 percent); and other services (7 percent) such as asset finance to but assets such as agricultural tools and equipment and livestock.

On the type of financial products that youth wished to see provided by these institutions the following was identified: Low interest loans and higher values; Savings and investment products; Training on financial literacy and management; and mentorship programmes.

a) Sources of business finance

This study found that from amongst youth agripreneurs, the most prevalent source of finance were personal savings which accounted for between 85 percent (Poultry VC) and 74 percent (Mango VC). The next important source of business finance was family sources comprising between 22 percent (Avocado and Mango VCs) and 6 percent (Poultry VC). From the findings the use of loans was very low accounting for between 4 percent (Mango VC) and 6 percent (Poultry VC).

Table 68. Sources of business finance by youth in Siaya County

Value chain	Savings	Loan	Family	Investors	Total
Poultry	85%	6%	6%	2 %	100%
Fish	82%	7%	11%	0%	100%
Avocado	78%	0%	22%	0%	100%
Mango	74%	4%	22%	0%	100%

3.3.3 Products suitable for youth

This study established a number of finance products suited for youth in agribusiness as follows.

a) Commercial bank products

Equity Bank - Kilimo Biashara: Equity Bank has 2 kinds of agribusiness loans, one targeting medium and large enterprises and another one, small scale farmers.

Kilimo Biashara Loan: This loan aids the small-scale farmer by financing the purchase of

farm inputs such as certified seeds fertilizers, chemicals and machinery, the hiring of labour and harvesting costs. Loan amounts granted are between K Sh 5 000 and K Sh 100 000. The repayment period is set at 1 year, or the crop production period/cycle; whichever is shorter. Security can be in chattels, moveable assets, fixed assets or acceptable guarantees.

KCB Bank Ltd agribusiness finance: this product offers agribusiness finance and loans in various agricultural value chains such as mango, avocado, poultry and fish. The products provide working capital (For purchase of seeds, fertilizers, inputs and equipment and assets) financing to farmers for a duration of three months up to one years (Based on the length of the season for the specific agricultural product) and loan sizes are based on the ability to pay by respective farmers up to a maximum of K Sh 250 million. To qualify for the financing, farmers must demonstrate ability to pay and the produce must have a specific off taker. The finance is based on a tripartite agreement between the farmer, input supplier and off taker on one side and the bank on the other.

b) Government agencies providing finance to youth in agribusiness

Youth Enterprise Development Fund (YEDF): YEDF aims at availing business funding and provision of business development services (BDS) to young people (18–35 years) in Kenya. This fund has an office in Siaya County. YEDF has a number of loan products suitable for youth in agri-business. For example, the fund has the Agri-Biz Loan targeted at young people to acquire agricultural equipment and working capital and financing is up to K Sh. 2 million at zero interest but with a 5 percent one off management fee and repayable in three years. This loan is available to both group-based individual youth agripreneurs (from K Sh 100 000) and youth groups (from K Sh 50 000). Some conditions include securing the loan, business history and group leadership

Uwezo Fund: This fund was launched in 2014 and it mirrors the YEDF and seeks to provide funding for women, youth and people living with disability at the constituency level. The fund also provides mentorship to target beneficiaries to access the preferential 30 percent of government procurement opportunities set under the access to government procurement pportunities (AGPO) program. Financing under Uwezo Fund ranges from K Sh 50 000 to 500 000 and is based on group lending at zero interest rate. Amani Women SHG is a case study in Siaya for Uwezo Fund

Women Enterprise Fund: This fund was established in 2007 and is under the Ministry of Public Service and Gender Affairs with a mandate to provide accessible and affordable credit to support women to start and expand businesses in Kenya. This fund makes out loans to women business owners based on group lending through the Constituency Women Enterprise Scheme (CWES). The groups must be registered "chamas' with at least ten members who are 100 percent women (or at least 70 percent women and 30 percent men). Loans range from K Sh 100 000 to 750 000 at zero interest but with a 5 percent one off management fee.

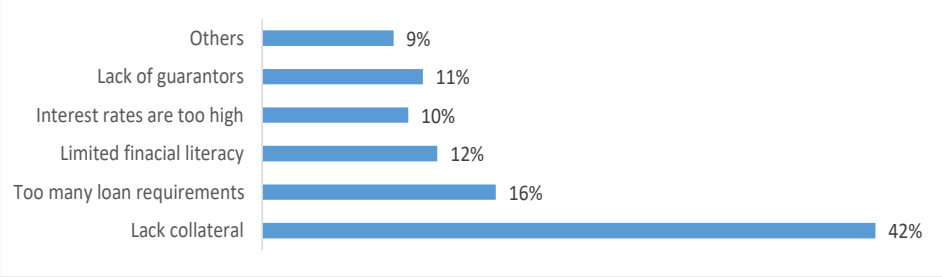
Agriculture Finance Corporation (AFC): AFC was founded in 1963 with the mandate of assisting in the development of agriculture and agricultural industries through provision of loans and providing technical and managerial assistance to loan beneficiaries. To date, AFC is a leading credit institution supporting farmers to secure finance for agribusiness activities such purchase of equipment, inputs, livestock and other supplies and also provision of working capital finance for farmers. Loans are provided for individuals and groups for a duration of 1–5 years at 10 percent interest rate with a requirement of committing 20 percent towards project costs. AFC offices are located in Bondo.

Kenya Industrial Estates (KIE): KIE was established in 1967 to provide technical training and financial support to the local Kenyans, KIE has grown to become a centre for both technical and business incubation. It offers loans to individuals and groups. Groups must be registered and demonstrated table leadership. It offers loans to individuals within the group who the rest co–guarantee until the whole group is covered. Loans are at 8 percent p.a. on reducing balance. Besides the loan, KIE continuously supports the youth with both technical and business skills to ensure that the goal is realized. KIE has an office and incubation centre in Siaya Township.

3.3.4 Challenges youth face in accessing finance

Youth in Siaya faced a number of challenges in accessing financial services and these were listed as follows: lack of collateral (42 percent), too many requirements when borrowing (16 percent), limited financial literacy (12 percent), interest rates were too high (10 percent), lack of guarantors (11 percent) and other challenges (9 percent) such as fear of being repossessed of assets in case of default. Not having proper records of their activities in agribusiness, lack of entrepreneurial activities that take advantage of the business potential in these value chains and poor financial prudence and discipline.

Figure 31. Challenges youth face in accessing finance



3.3.5 Youth alternative financing models available in Siaya County

One Acre Fund: They supply groups and group-based individuals with necessary inputs supporting agricultural value chains. Such inputs include seeds, fertilizers, solar lighting panels etc. as may be necessary. The group guarantees the supplied input and the loanees are allowed up to three month grace period before starting to repay. Loan periods are dependent on the type and purpose of the input supplied. Currently, this can be used for chicken farming, mango drying and other value chain nodes as agripreneurs may come up with.

3.4 Access to BDS services by youth in Siaya

In Siaya, BDS are provided by a mix of actors including private sector players, National and County Government agencies and NGOs.

3.4.1 Main providers of BDS services

This study found that the providers of BDS services in the Siaya County consisted on three namely categories namely; National and County Government Agencies, Non-Governmental Organizations (NGOs) and religious and churches.

Table 69. Providers of BDS services and type of products available in Siaya County

Name of Institutions	Type of BDS provided
a) National Government Institutions	
Kenya Forestry Research Institute (KEFRI)	• Advisory and market information services • Strengthening Climate-Smart Agricultural Research and Seed Systems
Kenya Industrial Estate (KIE)	These provide these services for incubation and agricultural production targeting individuals and groups. • Agricultural skills training • Technical and business management training services • Agricultural tools and appropriate technology • Financing and project management

Name of Institutions	Type of BDS provided
Kenya Climate Smart Agriculture Program (KSCAP)	• Training on production depending on the VC • Agro-smart practices and contingencies
Agricultural Sector Development Support Program (ASDPS)	• Technical and agricultural production in Mango, fish and indigenous chicken • Beneficial commercialization of fish, mango and chicken value chains • Business management skills in agribusiness • Market intelligence and linkages for selected value chains • Cooperation in technological innovation with agripreneurs • Policy interpretation and implementation support • Monitoring and evaluation of agribusiness activities
b) County Government of Siaya Institutions	
Siaya Agricultural Training Centre	They offer services mostly for free in these areas: • Agricultural practices training • Technical training • Business and management training • Extension services for planned and on demand
County Polytechnics and Vocational Training Centres (19 of them)	• Technical and Certificate courses in agriculture and agribusiness management • Agricultural technology skills • Technical and entrepreneurship incubation services Sponsorships (as much as K Sh 15 000 pa) for courses
County government Youth, Agricultural and Cooperatives department	• Policy development and support • Compliance • Budgetary support • Amalgamation and administrative support • Extension services
c) Non-Governmental Organizations (NGOs)	
GIZ	• Advocacy and policy development • Provision of farm inputs • Technical training and support • Market information and linkages
Anglican Development Services	• Technical Training • Post-harvest handling training

Name of Institutions	Type of BDS provided
One Acre Fund	• Technical training and support • Market information and linkages
d) Learning and Academic Institutions	
Jaramogi Oginga Odinga University of Science and Technology (JOOUST)	• Offer undergraduate and master's degrees in agriculture and agribusiness • Does research and partners with players • Has extension services to the community e.g. the university has held two successful Agribusiness short courses sponsored under the **2 jiajiri** KCB "Cage Fish Farming" for youth.
Siaya Technical Training Institute (SIST)	• Academic, Financial and business management training • Business Planning skills • Research and cooperation
e) Regulatory Bodies	
Kenya Plant Health Inspectorate Service (KEPHIS)	• Regulatory support • Compliance and Certification • Capacity Building
Pharmacy & Poisons Board of Kenya (PPBK)	• Compliance and Certification • Authorization and approval • Supervision and oversight

3.4.2 Type of BDS youth have received

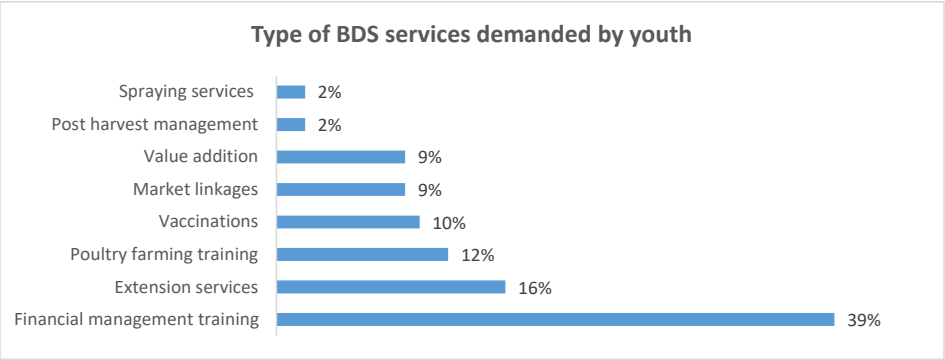
The study found that there were two main type of BDS services received by youth-business skills training and technical skills training. The most common areas of business skills training include; Sales and marketing; business record keeping and business plan development and preparation of proposals for funding. The main providers of business skills training were banks and MFIs such as KWFT, Equity Bank and NGOs such as World Vision, ADS and GIZ amongst others.

Technical skills training consisted topics on: good crop and animal husbandry techniques, pests and disease management, use of certified seeds, value addition and post-harvest management amongst others. The main providers of technical training to farmers were National Government institutions such as ASDSP (Mango, Fish and Poultry), Siaya County (Fish, Mango and Poultry), Kenya Climate Smart Agriculture Programme - KCSAP (Poultry and Fish) and Lower Nzoia Project (Mango and Avocado), NGOs such as World Vision (Mango VC), GIZ and Weitunga Heifner, KARLO and private institutions.

3.4.3 Demand for BDS by the youth in Siaya County

Results on demand for BDS revealed that the most sought after BDS service was financial management training (39 percent), followed by extension services (16 percent), poultry farming (12 percent), and animal vaccinations (10 percent); market linkages (9 percent); value addition training (9 percent); post-harvest management training (2 percent) and spraying services (2 percent). It was also noted that other BDS services sought included: trainings on business plan development, group dynamics, leadership and management, entrepreneurship skills, legislation and compliance and sales and marketing.

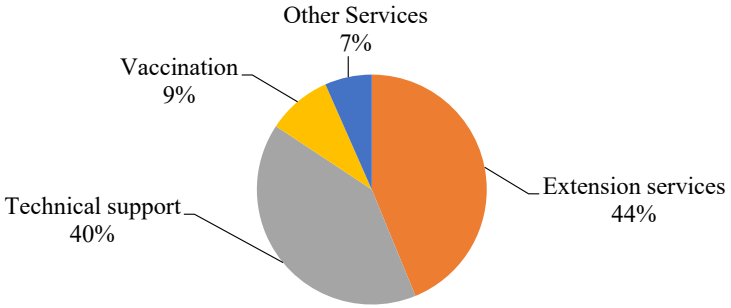
Figure 32. Type of BDS services demanded by youth



3.4.4 Engagement of youth in provision of BDS

The findings of the engagement of youths in the provision of BDS indicated that the youth were engaged in provision of some BDS services as agripreneurs and also as employees of BDS firMs For example, youths under the Siaya Youth in Agribusiness Association (SYAA) were engaged in provision of training and extension services in poultry and mango value chains. The association is a youth led initiative established in 2018 and which had membership of 120 youth (20 youth from each of the six sub-counties). The study found that the main type of BDS services provided by youth were extension services (44 percent), technical support (40 percent), vaccination (9 percent) and others at 7 percent for poultry, bee keeping, mango and avocado value chains.

Figure 33. Type of BDS services provided by youth in Siaya County



3.4.5 BDS products suitable for the youth in agri-business in Siaya County

The study findings revealed that the youth expressed the need for provision of BDS services as follows: Mango VC - accessible and affordable AI services, training on feeds formulation and feeds conservation and provision of livestock extension services; Fish VC need for financial linkages, training on ponds construction and feeds formulation and training on costing and pricing of products; Poultry VC Training on business planning and capital raising, financial linkages, provision of extension services and market linkages and training on costing and pricing of products; Avocado VC financial linkages, training on business planning and capital raising and market linkages and training on costing and pricing of products.

Table 70 : BDS products and services needed per VC in Siaya County

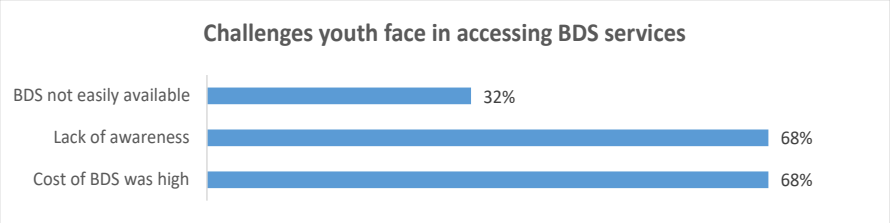
Mango VC	Fish VC	Poultry VC	Avocado VC
• Market linkages • Training on mango grafting	• Financial linkages • Training on feeds formulation;	• Training on chicken feeds formulation	• Training on avocado processing and value addition

Mango VC	Fish VC	Poultry VC	Avocado VC
• Capacity building on pests and diseases management • Financial linkages	• Trainings on fish fillet processing • Training on cage fish farming • Training on business planning and capital raising	• Training on business planning and capital raising • Financial linkages; • Provision of extension services • Market linkages;	• Training on establishment of tree nurseries for Hass variety seedlings • Financial and market linkages • Group formation and management

3.4.6 Challenges youth face in accessing BDS services

Findings from this study revealed that the greatest challenge to access of BDS was lack of awareness (68 percent), and high costs of BDS (68 percent) and lack of local providers (32 percent).

Figure 34. Challenges youth face in accessing BDS services



3.4.7 Opportunities available for the youth to engage in provision of BDS services

This study identified a number of opportunities for youth to engage in provision of BDS services as follows.

- Youth can take up opportunities as contracted facilitators for institutions that currently offer BDS services. For example, youth trained in crop and livestock extension can partner with existing institutions to provide BDS and extension services as part-timeservice providers.
- Youth can also provide BDS based on their own qualifications and training. For example, youth with agricultural training in veterinary can provide extension, vaccination and technical support to the farmers at a fee. This would fill the current gap experienced by farmers of limited extension services as well provide reliable vaccination services.
- Youth who have succeeded in agribusiness can provide BDS, mentorship and incubation services to other youth in the county this can be at a fee or through a subsidized programme supported by the County Government or other NGOs.

3.5 Overview on the Enabling environment for youth engagement in the selected value chains in Siaya County

This section reviews national and county government policies that provide an enabling environment for youth engagement in the selected value chains. In addition, the section also reviews the socio-cultural elements to take into consideration when engaging youth in the selected value chains.

3.5.1 National Government Policies

i) Agricultural Sector Development Strategy (ASDSP)

The Ministry of Agriculture's Agricultural Sector Development Support Programme II (ASDSP) 2017–2022 aims at transforming crop, livestock and fishery production into commercially

oriented enterprises that ensure sustainable food and nutrition security by developing environmentally resilient and socially inclusive value chains. Within the Siaya County, ASDSP is involved in supported three VCs fish, mango and poultry.

Table 71. ASDP Programme support to the prioritized VCs

Area	Value Chain	Activities
General	Mango, Fish & Poultry	• Established a County Steering Committee with youth representation • Domestication of Kenya Youth in Agribusiness Strategy • Promotion of innovations and technologies that improve agricultural productivity
Trainings	Mango, Fish & Poultry	• Trained youth on poultry feeds manufacturing • Trained youth groups on mango grafting and mango value addition; • Support youth with training to establish poultry processing • Trained youth on pests and disease control and supported the establishment of spraying teams in every sub-county • Trained and established vaccination teams in every Sub-county
Innovation	Mango, Fish & Poultry	• Working in partnership with the Agriculture Technology Development Centre (ATDC) to facilitate information sharing on innovations in the three VCs • Technology improvement and adaptation in partnership with ADTC • Supporting climate smart and green production techniques
Agri-business	Fish Mango Poultry	• Upskilling on entrepreneurship and opportunity mapping • Youth activation and participation building • Skills mapping and support • Local County programmes e.g. Mafan Clubs, Kuku Malezi Bora, and A-fish-a-day program. • BDS and financing linkages

ii) The Kenya Youth Agribusiness Strategy 2017–2021

Under the overall coordination of the Ministry of Agriculture Livestock and Fisheries, identifies eleven strategic objectives to address the challenges that hamper meaning and sustainable youth participation in agribusiness, namely: transform youth perception towards agribusiness:

a) Development of agribusiness skills, knowledge and information;

b) Improved access to affordable and youth friendly financial services for agripreneurship;

c) Enhance access and sustainable use of land;

d) Youth engagement in research and development of innovative agricultural technologies;

e) Enhance access to inputs, modern technologies and utilization of Good Agricultural Practices (GAP) to increase efficiency;

f) Increase utilization of agricultural products through value addition;

g) Improved access to affordable suitable output markets for the youth;

h) Support implementation, reviews and development of policies that create an enabling environment for youth in agripreneurship;

i) Promote youth-inclusive climate smart agricultural technologies and create green jobs for environmental sustainability; and

j) Promote an integrated approach to address cross-cutting challenges including gender disparities, cultural barriers, alcohol and substance abuse, HIV & AIDS, weak governance and value systems amongst others.

Upon successful implementation of this strategy, it is anticipated that there will be increased uptake of agribusiness activities by the youth thereby creating youth employment and empowerment.

3.5.2 County Government Policies

i) Siaya County Integrated Development Plan (CIDP), 2018–2022

The Siaya County CIDP, 2018–2022 prioritizes investments in agriculture, food, livestock and fisheries since this sector accounts for over 80 per cent of total economic activities and a larger percentage of employment opportunities in the county. To address challenges highlighted in the selected four VCs, the County CIDP identifies the following sector specific priorities.

Table 72. Siaya CIDP priorities targeted at fish, poultry, mango and avocado VCs

Sector priorities	Area of support	Nature of support
Improvement in agricultural and livestock production and productivity	Study and analysis	• Conducting key studies and identification of priority areas in selected agricultural VCs
	Improved Extension Services	• Plan to hire 486 crop and livestock extension officers; • Procure 23 new vehicles to support agricultural extension • Procure 125 motor cycles to support agricultural extension
	Develop and strengthen Agricultural institutions /resource centres	• Establish Four Agricultural Resource Centres and Institutions in Ugunja/ Ugenya, Gem/Siaya; Bondo/Rarieda
	Farmers' field days	• Organize 18 farmer field days per Sub-county; • Conduct 20 research extension workshops
Planning and policy	Develop legal and policy frameworks	• Enact Fisheries and Aquaculture Bill; • Enact Siaya Agricultural Development Policy; • Enact Siaya Cooperative Development Fund Bill

Sector priorities	Area of support	Nature of support
Crop development	Improved Access to quality farm inputs	• Procure and distribute 250 metric tonnes of of subsidized certified seeds • Procure and distribute 1 725 metric tonnes of subsidized fertilizers to farmers • Construct 30 grain storage facilities • Plough 31 000 acres of land using subsidized tractor • Train 62 000 farmers on Integrated Soil Fertility Management (ISFM); • Establish one modern soil laboratory
Agribusiness and information management	Improved Agroprocessing and value addition	• Increase by one processor each year
	Improved Agricultural information Accessibility	• Increase access and utilization of by one each year
	Promotion of agribusiness	• Conduct 2 agribusiness shows/ exhibitions every year
	Access to Agricultural Finance improved	• No. of farmer groups linked to Financial/ Credit institutions to increase from 6 to 30 by 2023
	Access to Agricultural insurance improved	• No of farmers linked to Agricultural insurance services/ institutions to increase from
Improvement in Fisheries	Training of Beach Management Units (BMU)	• Ensure at least 20 are trained each year
	Support BMUs with fisheries patrol units	• Increase 5 units every year
	Participation in the Lake Victoria Counties Fisheries Caucus Quarterly meetings	• Ensure 4 sessions each year
	No. of fishers trained on fish quality assurance;	• Ensure 400 each year
	No of fish farmers trained on aquaculture	• To train 200 fishers each year
	Functional Fish Hatchery and Demonstration Centre	• Create and maintain one central centre

3.5.3 Socio-cultural elements - formal/informal norms, unwritten codes of conduct, cultural preferences and habits to take into consideration in engaging youth in the value chains

i) Social-cultural

The Siaya County Integrated Development Plan (CIDP) identifies Siaya as one of the counties predominantly occupied by the Kenyan Luo tribe as per the KNBS, 2019 Census Report. Based on insights gained from discussions with youth respondents and other key informants, it was noted that the Luo cultural preferences and inclinations had an influence on the participation of youth in agribusiness.

a) It was noted that the local community is not agriculturally inclined hence there was low participation in especially land-based farming.

b) It was noted that fish trading and farming was very popular since fish is a stable food for the region. Poultry was also noted as a significant agricultural activity with notable participation by youth and women in this agribusiness enterprise.

c) Information from local key informants also took noted of the low prevalence of business innovation and entrepreneurship by locals with many youth having a preference for salaried employment than engaging in agribusiness.

d) The land tenure system favoured men and women and youth lacked access to land for agricultural production. Many parents were reluctant to give the young people land to establish agribusiness initiatives and this tended to discourage youth willing to venture into agribusiness.

e) Youth's natural impatience and drive for instant income and wealth had affected their pursuit of agribusiness which required nurturing, passion and resilience.

f) There was also an apparent "fear' amongst most locals of taking loans to invest in agribusiness activities. Locals shared narratives of many people who had suffered due to defaulting on loans and who had lost all their property to auctioneers and other debt recovery activities. These experiences discouraged many locals from seeking credit from financial institutions.

ii) Physical infrastructural elements

Siaya has a relatively flat terrain which does not rise higher than 300m from its lowest point at Lake Victoria to its highest point (1 100 and 1 400 M ASL). The County has a population of about 1 million people. There are 450 km of bitumen all weather roads traversing the county mostly on the more inhabited central and eastern sides. Another 1 300 km are motorable earth and 1 700km narrow roads. More roads are under construction to bitumen standards.

Air Transport: There are three airstrips in Siaya namely, Gombe, Dominion and Sega. Their conditions are however not good and may require some work.

Railway line: The main Kenya-Uganda railway passes through the northern side of the County from Kisumu to Busia. However, this hasn't been operational for many years.

Lake Ports: The County has three jetties namely Luanda K'Otieno, Asembo Bay and Usenge. Asembo Bay is however dysfunctional.

Postal & communication services: There are about 20 government postal service offices. Private companies also provide these services in the main county towns. These include G4S, Wells Fargo and EMs In addition, couriers' services are also provided by registered public service vehicles such as Easy Coach and the Guardian.

Energy and lighting: Approximately 70 percent of the County lacks electricity supply especially within the growing market centres and recently created administrative political units. This hinders realization of the County"s potential in agri-business processing, jua-kali development and efficient service delivery. Frequent power interruptions and outages

adversely affect businesses and institutions' operations. The county's main lighting is paraffin with close to 70 percent using it. About 25 percent have access to electricity (2016) with a small (6 percent) using solar power. 85 percent of Trading centres, 89 percent of health facilities and 97 percent of secondary schools across the county are connected to electricity. The main cooking appliances include traditional three stone 71.4 percent ordinary jiko 10.8 percent improved modern cook stove 14.5 percent, gas cooker 2 percent kerosene stove 0.6 percent and electric cooker at 0.07 percent

Learning Institutions: There are 19 youth polytechnics in the county spread across the county. There are close to 240 secondary schools and several tertiary institutions and colleges offering technical, agricultural and administrative courses. The county has close to 300 cooperative societies of which about 200 are active (2018). These are spread across producers, consumer, services, savings & credit, multi-purpose etc.

ICT: ICT is a major service enabler for Siaya County development as well as a source of employment for the citizenry especially the youth. The County has 90 percent mobile phone coverage with the main providers being Safaricom and Airtel. Internet connectivity through fibre optic cable is ongoing and the County targets to achieve 50 percent coverage within the current County Integrated Development Plan (CIDP, 2018–2022). A fibre optic cable from Maseno via Yala, Ugunja to Siaya Headquarter has been installed, a county website developed, internet provided up to sub county level, PABX system was installed at the county headquarters, ICT policy and implementation plan were adopted, fleet management system was installed, ICT Equipment were supplied to county offices, Wide and Local Area networks made available (6 sub-counties covered so far) and CCTV cameras installed. These ICT milestones have enhanced information access and sharing, transparency on revenue collection. The county seeks to establish 6 State-of-the-art sub county digital villages to Improve access to ICT Services. However, budget constraints have derailed actualization of these digital villages which will accelerate youth in rural parts have access to information and exploit any existing opportunities for decent work.

3.6 Value chain (s) governance and youth representation within governance mechanisms

This section provides an overview of youth representation within the governance mechanisms in the four selected VCs in Siaya County.

Poultry value chain: It was noted that poultry farming in Siaya was mostly carried out by youth and women. Most production activities are based in domestic settings where homeowner women are also poultry owners. These women could also be youth in many circumstances. The Moiye Group in Bondo is a good example.

Youth are also poultry producers in their own right-investing in poultry farming as owners and value node actors. Youth are also aggregators and marketers collecting life birds from individual farmers and delivering them to consumers. Youth earn either income from sale of own poultry or wages from employment or services they offer to farmers. Others earn fees as transporters or service providers to actors in the value chain. There are opportunities for youth to invest more in poultry production or any other node within the value chain. This is mainly because most of the nodes are not well structured and can become revenue earners for them. Well organized node activities will also influence growth in production. Value addition and processing are also areas of opportunity. Youth can come together and procure either services of materials necessary for volume participation in the selected node or the whole value chain. Cooperation with support entities e.g. cooperative movement, government agencies, NGOs and financiers can unlock this potential.

Avocado value chain: Avocado is still a very marketable fruit both in Siaya and out of it. The production of avocado in Siaya is low hence, there are avocado value chain actors who are importers. Youth participate in production as service providers due to the need to have land which they don't have. They prune, weed, harvest and transport to where they are required. Others import avocado to the county to meet the demand which in necessitated by the low supply. Some youth participate as processors by juicing e.g. Sparrow Juicers at Siaya.

There are opportunities for youth in the avocado value chain in production especially through contract farming whereby they would lease land for that purpose. More aggregation based on better market intelligence can also be done for markets even outside the county. This way, they can earn better incomes for themselves. Provision of input services e.g. nurseries; spraying etc is also a good opportunity. There's still a great need for fruit processing in the county. This can be achieved through cooperative investment.

Fish value chain: It was noted that youth participation in the fish VC governance was high. For example, production activities were mostly managed by youth. Further, most of the Beach Management Units (BMUs) were managed by youth groups who have come together to manage fish harvesting activities by the lake side. For instance, The Nambo BMU unit (Osieko) had over 80 members most of whom were youth and at least 1/3 of the members were female. The leadership of the BMU was also made up of youth.

In cage farming, most of the participants were young people managing the units, providing security, feeding, harvesting, and also providing administrative support. In Usenge Beach, it was noted that cage farming was almost primarily ran by youth, though almost all of the members and leadership were men. Fish pond farming activities are also ran by youth. These included trenching, brooding, harvesting, administration and sales. This study established that youth were mostly involved in short term labour-based activities on self-employmentor as casual workers. However, it was noted that fish cages, ponds, boats and other capital investments in the fish VC were mostly owned by non-youth. Accordingly, an opportunity exists for youth to pool resources together by establishing your groups that would enable acquisition of capital investments for use in fish farming.

Mango value chain: The mango value chain has several nodes which youth participate in. However, there are few youths as owner-producers due to the necessity for land which most youth do not have. Youth participate in production as wage earners providing services e.g. spraying, pruning, weeding, harvesting and transportation. Youth however are aggregators and distributors by uptaking fruits from the farm gate or at markets and placing them in areas of need.

Others are processors when they juice the mangos for consumption at shopping centres and in town, e.g. the Sparrow shop at Siaya town. Here, they earn both incomes and waged depending on their participation. When the Ramba plant is operational, youth participate as salary earners. There are opportunities for youth in the mango value chain in production especially through contract farming whereby they would lease land for that purpose. More aggregation based on better market intelligence can also be done for markets even outside the county. This way, they can earn better incomes for themselves. Provision of input services e.g. nurseries; spraying etc is also a good opportunity. There's still a great need for mango processing in the county. This can be achieved through cooperative investment.

3.7 Youth-centered upgrading strategies and recommendations for the prioritized value chains in Kakamega

3.7.1 SWOT analysis of each value chain in terms of youth participation in different value chain segments and service provision.

i) **Poultry VC**

STRENGTHS	WEAKNESSES
• Little land space required for poultry production that is accessible to youth • Large market for birds and eggs within and outside the country • Little capital required to start and maintain the value chain • VC nodes are well segregated and youth easily enter and exit any • Readily available inputs e.g. medicines, feeds and BDS for the VC.	• Lack of collateral to enable the youths obtain financing from financial institutions • Negative perception of youth to poultry farming. It is for women and children • Limited information by youth on existing opportunities in the poultry VC • Cultural inhibitions that frown at children having more "wealth" than parents while in the same homestead • Lack of proper market linkages for chicken and eggs. • Unreliable and expensive inputs e.g. day old chicks, medicines and feeds
OPPORTUNITIES	**THREATS**
• Unutilized market within and outside the county • Demand for day-old chicks is still unmet • Aggregation and value addition activities • Quality and economically viable inputs especially in feeds • Processing potential as no such enterprise exists. • Reliable and extension services in medication and vaccination which youth can undertake • Provision of skills and knowledge both on rearing and business management • Provision of market intelligence and linkages • Aggregations services to stabilize and guarantee prices and supply.	• Cheaper options in chicken and inputs from neighbouring areas especially Uganda • Uncertified inputs e.g. medicines presenting risks to the poultry • Unregulated poultry market • Availability of other protein sources e.g. fish and legumes • Potential for chicken

ii) Avocado VC

STRENGTHS	WEAKNESSES
• Sufficient land supply: there are over two hundred thousand hectares of arable land in the county, with mango taking a very small portion of it. • Availability of labour and skills • Presence of a fruit processing plant albeit currently inactive • Availability of market both locally and outside the county	• Low production: avocado production is still low, with a lot of it being the indigenous type • Insignificant processing activities: there is one unoperational fruit processing plant in the county, which even at full capacity cannot process the current county output • Low market linkages - the area has little linkages to the outside with most marketing activities based in the county. • Ineffective value chain linkages that support the various nodes in the VC. • Not enough support and /or innovation to the existing technical service providers to respond to local challenges • Inhibiting cultural land ownership practices which does not support children to farm freely in their parents' land
OPPORTUNITIES	**THREATS**
• Regulatory and county support especially through agricultural legislation still in draft • Farming of exotic avocado mango species which are fast maturing and high yielding • Provision to high quality exotic seedlings • Formation of farmer groups to leverage on their numbers for reduced cost of production and attract relevant BDS services • Structuring leased land and contract farming to reduce family land dependence • Activation of the Ramba Fruit processing factory to off take from farmers for moderation of supply and price • Backward and forward linkages with producers and sellers of finished products	• Continued dependence on indigenous species which are low yielding and low income generating. • Continued challenge in county budgetary support for BDS and technical support. • Inaction on activation of the existing Ramba processors to stabilize supply and prices • Availability of cheaper and better avocados from neighbouring counties of Vihiga and Kakamega. •

iii) Fish VC

STRENGTHS	WEAKNESSES
• Low entry costs as youth can start from being employees • Widespread labour and skill levels available • There is sufficient water in the la and rivers • There is sufficient market within and outside the county • Little land is required especially for lake/ river-based fishing • Little upkeep and maintenance required for river/lake fish farming	• Poor fish infrastructural support e.g. cold storage and movement, market linkages etc. • Poor group management/dynamics: many groups failing due to management wrangles and lack of member motivation • High entry and operational costs: cages, ponds, fish food, employees, boats, nets, fuel, navigation, fishing gear etc. • Poor working conditions:there are no safety mechanisms in the lake, no employment contracts, no other benefits, no job guarantee • Insecurity: there are fish pirates in the lake who steal the catch and the equipment, fish cages have to be protected
OPPORTUNITIES	**THREATS**
• Unmet demand for fish even within the county • Increased government support in security, inspection, surveillance, quality assurance etc. • Simple and applicable certification services for different nodes of the value chain • Processing, aggregation and value addition activities e.g. cold storage • BDS, market intelligence and linkage services • Participation in environmental betterment through river and lake clean up activities • Capital and labour investment in cage fish farming to increase production and reduce costs • Contract fishing to stabilize supply and prices • Unmet demand for inputs e.g. fingerlings and feeds	• Unregulated industry making it prone to unscrupulous players • Little or no participation by either local or national government • Harassment and intimidation by Ugandan police in L. Victoria and local authorities at landing sites • Lake water contamination and invasive plants e.g. hyacinth. A lot of industrial and sewer effluence going into the la and rivers.

iv) Mango VC

STRENGTHS	WEAKNESSES
• Sufficient land supply: there are over two hundred thousand hectares of arable land in the county, with mango taking a very small portion of it. • Availability of labour and skills • Presence of a fruit processing plant albeit currently inactive • Availability of market both locally and outside the county	• Low production: mango production is still low, with a lot of it being the indigenous type • Insignificant processing activities: there is one unoperational fruit processing plant in the county, which even at full capacity cannot process the current county output • Low market linkages: the area has little linkages to the outside with most marketing activities based in the county. • Ineffective value chain linkages that support the various nodes in the VC. • Not enough support and /or innovation to the existing technical service providers to respond to local challenges • Inhibiting cultural land ownership practices which does not support youth to farm freely in their parents' land
OPPORTUNITIES	**THREATS**
• Regulatory and county support especially through agricultural legislation still in draft • Farming of exotic mango species which are fast maturing and high yielding • Provision to high quality seedlings • Formation of farmer groups to leverage on their numbers for reduced cost of production and attract relevant BDS services • Structuring leased land and contract farming to reduce family land dependence • Activation of the Ramba Fruit processing factory which used to off take produce from farmers thereby guaranteeing both market and price stability • Backward and forward linkages with producers and sellers of finished products which will result to better prices leading to creation of decent jobs especially for young people • Ready market for mango juices.	• Continued dependence on indigenous species which are low yielding and low income generating. • Continued challenge in county budgetary support for BDS and technical support. • Imports of cheaper and better mangos from neighbouring counties of Vihiga and Kakamega.

3.7.2 Root causes of constraints limiting the generation of decent jobs for youth in the selected value chains

a) General constraints for all value chains

i) Limited extension services: it was noted that provision of crop and livestock extension services to farmers was a challenge which was majorly affected by low budgetary allocation. As a result, crop and animal productivity was below optimum due to limited knowledge by farmers on good agricultural practices, management of pests and disease outbreak amongst others. As a result of challenges, creation of decent jobs in farming was an uphill task.

ii) Low market linkages: it was noted that limited market linkages were a key challenge that affected all products in the four identified VCs. As a result, many farmers fetched low prices for agricultural produce which affected the viability of many enterprises and limited the creation of decent jobs especially for young people.

iii) Limited access to BDS: the limited access to BDS such as trainings, mentorship and incubation services a significant constraint especially to youth led and youth owned businesses that limited growth of these businesses and also affected generation of decent jobs within these VCs.

iv) Negative perception to debt: many locals in Siaya were averse to credit financing, because of fear of being auctioned, especially their land which, was one of the collaterals needed by the financing institutions to access credit. These factors negatively affected growth of agribusiness enterprises and the generation of decent jobs.

b) Constraints in the poultry value chain

i) High cost of poultry feeds: farmers highlighted that the cost of feeds - chick mash, growers and layers mash - was very high, making poultry venture unviable. Due to this factor, many farmers sold chicken before full maturity to cut on costs of feeds.

ii) Inadequate funds to start the enterprise: For one to start a poultry enterprise, one has to have a start-up capital to construct the poultry house, purchase chicks and feeds. All these require capital which most youth cannot afford.

iii) Incidences of diseases: it was established that Newcastle Disease, Fowl Pox, typhoid and Gumboro were the most prevalent diseases affecting poultry farmers in the county. This was made worse by lack of extension services and limited information by farmers on disease management in addition to high costs of vaccines.

iv) Scarcity of hatching eggs and the high cost of establishing and running a hatchery was also a significant challenge in scaling up poultry production.

v) Influx of cheap imports of eggs and chicken from Uganda contributed to unfair competition and forced farmers to sell products at unfavourable prices.

vi) Limited access to credit and loans: due to limited access to loans and credit youth farmers were not able to establish processing facilities which would contribute to creation of decent jobs for youth in the chicken VC.

a) Constraints in avocado value chain

i) Very low production: the level of avocado production was very low and most of what was produced were local varieties of the fruit whose sales price is low as compared to the Hass variety.

ii) Access to seeds for the Hass variety of avocado was limited.

iii) Incidences of pests and disease was a challenge.

iv) Inadequate crop extension services.

v) Low prices offered for the avocado fruit in the market.

b) Constraints in the fish value chain

i) Lack of storage services: this led to post-harvest losses due to fish going bad and quick sale of the fish at throw away prices to minimize losses.

ii) Accessing inputs was difficult:fish feeds and fingerlings were very expensive. This led to early harvesting of and hence low weights of harvested fish and consequently low market prices.

iii) Poor breeds of fingerlings: some of the fingerlings available in the market were of low quality and contributed to low quality yields of fish.

iv) Limited access to credit and loans: due to limited access to loans and credit farmers were not able to establish fish aggregation and processing enterprises which were profitable ventures that can also create employment.

c) **Constraints in mango value chain**

i) Low production: mango production was still low, with the bulk of produce being from local varieties which attract less sales as compared to Apple, Tomi Artkins and Ngowe varieties which have a higher selling price and recommended for export

ii) Pest and disease challenges.

iii) Insignificant processing activities: there is one unoperational fruit processing which was largely idle due to low fruit production in the county.

iv) Low prices offered for the mango fruit in the market.

3.7.3 Opportunity finding for youth in the core and extended value chain

The main objective of this study was to identify opportunities for youth productive engagement in the four prioritized value chains in Siaya County. The following table summarizes the opportunities identified by node of the four core and extended value chains and outlined through the following columns;

- **VC Node:** Core Value Chain (production, aggregation, processing and distribution) and Extended Value Chain (inputs and VC specific activities)**.**
- **Task/Job youth not currently engaged:** these are tasks currently being done but not by the youth.
- **Task/Job youth's current engagement can be upgraded/expanded:** tasks being done by the youth but they can achieve more through an upgrade or expansion of the engagement.
- **Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts):** tasks that need improvement of modification for the youth to enjoy decent work opportunities.
- **Opportunities not exploited:** these are opportunities existing in the VC nodes but the youth are yet to exploit them.

Table 73. Opportunity finding for youth in the core and extended value chains

A. Poultry

S/No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a) Core Value Chain					
1.	Production	Bulk hatchery	Group based investment	Contract farming	Bulk production
2.	Aggregation	Bulk aggregation	Market linkages	BDS, uptaker contracts	Moderation of supply & prices
3.	Processing	No major processing activities existing apart from defeathering and slaughtering	In selling cooked chicken, small parts	Mechanization of processing activities	Industrial production, processing by products
4.	Distribution	Information based trading	Market knowledge	Contract supply	Guarantee supply
b) Extended Value Chain					
1.	Inputs	Selling of drugs, vaccines etc	Training and Market information, Tech inputs	Contracting with producers, supplier	Extension services
2.	VC Specific Services	Value addition, processing of by-products	Innovation on technology, extension services	BDS, Market linkages	Bulk production, processing, supply

B. Avocado

S/No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
d) **Core Value Chain**					
1.	Production	Distributors and traders	Inputters through training	Contract farming, leased land	Inputters, nurseries
2.	Aggregation	Uptakers for the market	BDS in marketing and value addition	Market linkages and contracts	Market/price moderation

S/No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
3.	Processing	Value addition	Preservation and value addition	Employees or/and group-based investment	Processing and by-products
4.	Distribution	All of distribution	Contracts with processors	Youth are not engaged	All of distributorship
e)	**Extended Value Chain**				
1.	Inputs	BDS, Agro chemicals	Production inputters - grafters, nurseries	Training and self -employment	Group based input ventures
2.	VC Specific Services	Agronomists	Extension services	VC specific inputs	Extension services

C. Fish

S/No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
1.	Production	Supplies e.g. nets, bait etc.	Mechanization, capital investment	Group investment, contracting	Cage & pond farming
2.	Aggregation	Cold storage	Procure storage facilities	Contract producers, buyers, group-based investment	Moderation of supply/price
3.	Processing	Value addition	Processing of fish shrimp	Working conditions and mechanization	Value addition activities
4.	Distribution	Marketing	Capacity	Modernization of distribution tools	Capacity and modernization
b)	**Extended Value Chain**				
1.	Inputs	Inputs selling	Increasing capacity	Marketing and sales	Making and stocking
2.	VC Specific Services	Fish food making			Affordable fish food

D. Mango

S/No.	VC Node	Task/Job youth not currently engaged	Task/Job youth's current engagement can be upgraded/ expanded	Task/Job youth's current engagement can be modified/ improved (e.g. working conditions, contracts	Opportunities not exploited
a)	**Core Value Chain**				
1.	Production	Owner producer	Leased land, contract farming, BDS, Investment	Shared crop ownership	Leased farming
2.	Aggregation	Bulk uptakers	Processer contracts, market access	Enhanced wages, benefits	Market linkages, preservation
3.	Processing	Factory based processing	Enhanced processing and preservation	Mechanization, drying, juicing	Pulp and juice production
4.	Distribution	Bulk distribution	Value added products and by products	Market linkages, capital investment	Supply and price moderation
b)	**Extended Value Chain**				
1.	Inputs	Stockists, makers	Mechanization, BDS, group-based investment	Supply chain management, land leasing (seedling)	Extension services,
2.	VC Specific Services	Pulp and juice packing	Functional processers	Contracting	Investment in processing

A. Opportunities in poultry VC

i) **Poultry feed formulation**: There is need to train the youth on poultry feed formulation using locally available rations. This will mitigate the challenge of expensive commercial feeds encouraging more farmers and especially the youth to join or increase their production levels at a lower cost hence more profits. This will also create employment for the youth.

ii) **Training farmers' training on disease management:** The youth could be trained on disease management as ToTs and offer the service to other farmers.

iii) **Engage in aggregation of chicken and eggs:** the youth have an opportunity to establish poultry cooperatives to enable aggregation of chicken and eggs. Through this cooperative model, the youth can be able to mobilize capital and also negotiate with off takers for purchase of chicken products.

iv) **Engage in hatching of chicks**: The youth can individually or in groups engage in hatchery business to bridge the current supply-demand gap for one-day-old chicks

v) **Poultry feed formulation**: The youth can engage in formulation of poultry feed using locally available materials to provide affordable feeds to the farmers.

vi) **Upscale cooking and selling of poultry products:** The youth can upscale cooking poultry products sourced from their own farms or from other farmers.

B. Opportunities in Avocado VC

i) **Engage in Avocado seedlings production:** Considering that there is sufficient and appropriate land supply, because the County has huge arable land which is still unutilized, and that there ia clear market for it, more youths can be encouraged to establish avocado seedlings beds.[29] This activity would not require a lot of land and can be established with the support of the County Government and other development actors.

ii) **Establish market linkages:** Avocado has a big market both locally, nationally and internationally. The youths can engage in establishing market linkages through online platforMs

iii) **Value addition of avocado**: big interest and widespread adaptability. There is a lot of subsistence avocado grown for home consumption. With more sensitization on the available opportunities in the VC, the farmers can upgrade to commercial farming and the youths can engage in avocado value addition e.g. sale of juices on small scale that does not require sophisticated machines.

iv) **Provision of transportation services:** youth can provide transport services through use of motorcycles for small quantitities and use leased pick-ups for large quantities.

v) **Establish avocado collection centres**: youth can form groups and establish collection centres for avocado for further distribution to potential markets.

C. Opportunities in fish VC

i) **Engage in fish pond farming**: The county has a long Lake Victoria frontage, several rivers and streams, adequate rainfall and underground water sources and there is an opportunity to establish fish ponds to increase fish production. Youth can take advantage of the availability of land to engage in pond and cage farming

ii) **Engage in fish cage farming**: There is an opportunity for youth to engage in cage fish farming by supporting them to acquire the equipment and materials used in the cage fish farming business.

iii) **Establish Financial linkages**: This is to help in funding of establishment of fish ponds and purchasing fishing gears and cooling equipment for the fish harvested.

iv) **Fish feed formulation**: This will help the youth reduce the cost of production by providing alternative affordable fish feeds and further create employment for those who will be engaged in the process of formulation, packaging and distribution.

v) **Engage in fish aggregation**: Youth can establish aggregator cooperatives which can buy fish from farmers and store the fish in fish freezer boxes prior to delivery of the fish to traders or to hotels and restaurants.

vi) **Provide transportation services:** Youth can also be engaged in transportation of fish from farmers to traders and buyers using motorcycles.

vii) **Fish value addition**: Youth can engage in fish value addition such as making fish samosas, fish fillet and fish fingers and cooking fried fish.

viii) **Engage in fingerlings hatching**: Youth can specialize in hatching fingerlings for supply to the ready market.

D. Opportunities in mango VC

i) **Establish mango seedlings beds**: there are over two hundred thousand hectares of arable land in the county, with mango taking a very small portion of it. More youths can be sensitized and encouraged to establish mango seedlings beds.

[29] Gross margin analysis on avocado seedlings is provided in appendix 4.

ii) **Value addition of mango**: The processing VC node has not been fully exploited: There is need to revive the existing processing plant to create opportunities for the youth and other players in the VC.

iii) **Provision of Spraying services:** Youth can be engaged in providing spraying services to mango farmers for application of pesticides, fungicides and herbicides.

iv) **Establish Mango aggregation centres**: With high demand for mango, youth can establish aggregation collection centres and buy mango fruits from farmers and sell in market centres.

v) **Establish Financial linkages:** to enable the youth business owners acquire commercial blenders and deep freezers to reduce spoilage and further meet the high demand for mango juice.

4 Summary and recommendations

4.1 Summary of study findings

4.1.1 Most promising upgrading opportunities in Kakamega County for decent youth employment promotion in the value chain (s) as identified in previous sections

	Opportunity	Agri-pren eurhip	Wage em-ploy-ment	Scale (can this employ many youths or a few?) You can give stars: *, **, ***, ****	Gender specifi-cations (M: mostly for young males; F: mostly for young women; E: equal)	Level of intensity in land/ capital/ skills	Decent work risks	Level of profit-ability/ pay (give stars)	Level of chang-es in ena-bling envi-ron-ment re-quired (give stars)
Poultry VC	Brooding of one-day-old chicks	Yes	Yes	*****	E	Land: ** Capital: ** Skills: **	Chicken dust and vaccines contami-nation	*****	**
	Engage in aggre-gation of one- day-old chicks	Yes	Yes	****	E	Land: * Capital: ** Skills: *	No sup-ply con-tracts	****	**
	Establish hatcher-ies as individu-als or as groups	Yes	Yes	****	E	Land: * Capital: **** Skills: *	No labour contracts for wage workers	****	*
	Offering vaccina-tion ser-vices to poultry farmers	Yes	Yes	****	E	Capital: ** Skills: ****	Vaccine's contami-nation	*****	**
Dairy VC	Engage in milk aggrega-tion	Yes	Yes	******	E	Land: ** Capital: **** Skills:**	No sup-ply con-tracts	*****	*****
	Establish-ing small business for milk value addi-tion and ATMs	Yes	Yes	******	E	Land: Capital: **** Skills:**	No labour contracts for wage workers	*****	**
	Fodder produc-tion and conserva-tion	Yes	Yes	****	E	Land: ***** Capital: ***** Skills:**	No labour contracts for wage workers	*****	*

	Opportunity	Agri-pren–eurhip	Wage em-ploy-ment	Scale (can this employ many youths or a few?) You can give stars: *, **, ***, ****	Gender specifications (M: mostly for young males; F: mostly for young women; E: equal)	Level of intensity in land/ capital/ skills	Decent work risks	Level of profit-ability/ pay (give stars)	Level of chang-es in ena-bling envi-ron-ment re-quired (give stars)
	Provi-sion of extension services	Yes	Yes	****	E	Capital: ** Skills:*****	No labour contracts for wage workers	****	***
Fish VC	Engage in fish aggre-gation services	Yes	Yes	******	E	Land: * Capital: **** Skills:*	No labour contracts for wage workers	*****	**
	Value ad-dition of fish	Yes	Yes	*****	F	Land: Capital: ** Skills:*	No labour contracts for wage workers	*****	**
	Provi-sion of extension services	Yes	Yes	****	E	Capital: ** Skills:*****	No labour contracts	****	**
	Fish pond construc-tion	Yes	Yes	****	M	Land: Capital: * Skills:**	Injuries in con-struction	****	*
Soya VC	Value ad-dition of Soya to Soya oil	Yes	Yes	*****	E	Capital: *** Skills:***	No labour contracts	*****	**
	Soya Bean seed mul-tipliers	Yes	Yes	*****	E	Land: ***** Capital: ***** Skills:***	No labour contracts for wage workers	*****	**
	Engage in aggre-gation services	Yes	Yes	*****	E	Land: * Capital: **** Skills:*	No labour contracts for wage workers	*****	**
	Provison of trans-portation services	Yes	Yes	****	M	Capital: **** Skills:****	No labour contracts for wage workers	*****	**

4.1.2 Upgrading strategies and corresponding concrete recommendations for each node of the value chain in Kakamega county

For all Value Chains	Upgrading strategies recommendations
General	• **Train youth as community-extension workers to provide paid services to farmers** in the four value chains identified. For example, some youths have been involved in providing vaccination services for poultry. • **Support a more coordinated approach by service providers - government and non-government to enhance value addition** activities in all the Value Chains to enhance opportunities the youths can engage in. • **Increase VC specific and youth-targeted BDS** - Such as, VC farming and management, group management, leadership, financial management, marketing etc • **Generate awareness on agribusiness** as a worthwhile income earner for youth, by identifying and giving visibility to young women and men champions in agribusiness and to their stories • **Enhance the budgetary allocation and extension services** of government agricultural programs • **Encourage youth group-based investments** and support them to harness synergies and economies of scale. This should be through awareness creation since most of the affordable credit; from government is channeled through group-lending e.g. YEDF, Uwezo and Women Fund • **Enhance financial linkages for young agripreneurs and youth groups to enhance credit support**: strengthening of financial linkages will enhance credit provision opportunities to the youth, especially those who are acting as producers in all of the value chains. This is because production across the prioritized value chains is low inhibiting possible sustainable value addition initiatives due to unguatanteed supplies • **Improve access to market information and dissemination:** producers do not have systematic ways of accessing information on commodity prices and market opportunities to improve the situation. Development partners could support the youth to establish platforms to link farmers with information on regular basis to enable them to respond more effectively to market needs. • **Address issues of labour formalization** especially among wage workers and monitor/promote adoption of OSH measures along the VC

a) Poultry	
Value chain node	**Upgrading strategies recommendations**
Production	• **Train and sensitizate youth groups on poultry farming** as a business. This should include training on breeding, technologies to improve poultry production and marketing amongst others. • **Train young people on hatchery and brooding technology** to increase supply of chicks to farmers while creating employment opportunities.
Aggregation	• **Conduct awareness raising activities to encourage the youth** to join existing cooperatives and associations and form or join existing youth groups to ensure they benefit from economies of scale. This should be done by or in collaboration with fellow youths in these associations, cooperatives and youth groups for peer learnibg
Distribution	• **Facilitate enhancement of the transport modes** to minimize egg breakages and bird mortalities due to use of motorcycles by the youth.
Processing	• **Facilitate youth to establish basic processing units** with most needed equipment such as refrigerators and cutting machines.
Inputs	• **Encourage more youth to be trained in feed formulation** to mitigate the major challenge of expensive poultry feeds. After the training they can be suppliers of affordable feeds and also train farmers on feed formulation at a fee
b) Dairy VC	
Value chain node	**Upgrading strategies recommendations**
Production	• **Support youth to engage in plantation of fodder for dairy farming**: it is noted that there is an acute shortage of fodder for dairy farmers. There is need to sensitize youth to venture into planting fodder. There is a significant gap. Youth can be provided with seed capital to lease land and seeds to plant fodder. • **Support more youth to engage in dairy production** especially in feed formulation and farm management
Aggregation	• **Sensitize more young farmers on the need to join the cooperatives** for guaranteed market and opportunities to influence decision making in the cooperatives, The youth will bring new technologically advanced ideas with updated market information
Distribution/ Marketing	• **Support young men to enhance their transportation modes** to incorporate coolers for bulk supplies and safe transport
Processing	• **Fast track establishment of the milk processing plant** which will create more employment opportunities for the youth
Inputs	• **Provide technical skills training for the youth especially on agricultural extension services** such as AI services and vaccination

c) Fish VC	
Value chain node	**Upgrading strategies recommendations**
Production	• **Support youth investment in pond-based farming** which is easier for the youth to control and manage • **Increase county government and other partners support in provision of subsidies to buy fish feeds and fingerlings**. This will mitigate the challenge of lack of capital for the youth
Aggregation	• Sensitize youth through training, on contracting producers to ensure continuous supply • Support the youth to invest in infrastructure for cold storage facilities • Facilitation for quality control and value addition for the youth through training on how to do value addition across the VCs while adhering to existing quality control measures. The youth can engage in value addition as inidividuals and as a group for the capital-intensive value addition opportunities
Distribution	• Facilitate the access of youth to targeted and relevant market intelligence through research and networking • Support the youth to invest in mobile and regional cold storage facilities
Processing	• Contracting with local youth producers for guaranteed supplies and market of their produce. This is by sensitizing the exisiting processors on the need to establish contracts with the youth producers • Investments in fish processing infrastructure to increase the opportunities youth can engage in such as employment • Backward linkages to support other nodes e.g. production and aggregation • BDS services in value addition and processing standards. • Utilization of the local technical and financial service providers who can easily relate and identify with the youths in the county
Inputs	• Increased research and data utilization to ensure youth targeted responses in the value chain to address inputs challenges identified. • Encourage and facilitate the youth to provide better quality and economically viable fish seed stock and feeds • Local volume manufacture / fabrication of input items e.g. cages, nets. This will reduce the costs of inputs for the youths easing their entry into the VC • Utilization of the available government technology infrastructure e.g. ATDC and KIE to provide domesticated youth-specific solutions.

d) Soya	
Value chain node	**Upgrading strategies recommendations**
Production	• **Encourage more youths to engage in soya beans farming**. Given that the seeds are given by SOFDI, there is need to sensitize and encourage youth to do production so that the demand for soya can be met
Processing	• **Support youth in engaging in existing processing activities** Electricity connection to the processing plant will enhance processing activities and also encourage more youth to engage in the processing activities. Current manual processing isn't appealing to the youth and limits the quantities of soya beans processed
Inputs	• **Encourage and support more youth to be seed multipliers**. Sale of seeds generates better income than sale of soybeans A kilogram of seeds is sold at K Sh. 100 while that of soybeans sells at K Sh. 50–60/= per kilogram

4.1.3 Most promising upgrading opportunities in Siaya County for decent youth employment promotion in the value chain (s) as identified in previous sections (both entrepreneurship and wage employment; both expanding existing opportunities and harnessing untapped ones).

	Opportunity	**Agri preneurship**	**Wage employment**	**Scale (can this employ many youth or a few?) You can give stars: *, **, ***, ******	**Gender specifications (M: mostly for young males; F: mostly for young women; E: equal)**	**Level of intensity in land/ capital/ skills**	**Decent work risks**	**Level of profitability/ pay (give stars)**	**Level of changes in enabling environment required (give stars)**
Poultry VC	Engage in hatching of chicks	Yes	Yes	******	E	Land: * Capital: **** Skills:*	No labour contracts for wage workers	****	*
	Offering vaccination services to poultry farmers	Yes	Yes	*****	E	Capital: ** Skills:****	Vaccines contamination	*****	**
	Poultry Feed formulation	Yes	Yes	****	M	Land: *** Capital: *** Skills:***	None specific	*****	***
	Upscale cooking and selling of poultry products	Yes	Yes	****	E	Capital: ** Skills:**	No labour contracts for wage workers	****	**

Avocado VC	Value addition of avocados	Yes	Yes	*****	E	Land: * Capital: **** Skills:**	No labour contracts for wage workers	******	**
	Provision of transportation services	Yes	Yes	*****	M	Land: Capital: ***** Skills:**	Motor-cycle accidents	****	**
	Establish avocado seedlings beds	Yes	Yes	*****	E	Land: **** Capital: *** Skills:***	No labour contracts for wage workers	*****	**
	Establish avocado collection centres	Yes	Yes	****	E	Land: ** Capital: ***** Skills:**	No supply contracts	****	**
Fish VC	Value addition of fish	Yes	Yes	*****	F	Land: Capital: ** Skills:*	No labour contracts for wage workers	*****	**
	Fish cage farming	Yes	Yes	****	M	Land: *** Capital: ***** Skills:***	No labour contracts for wage workers	*****	***
	Fish pond farming	Yes	Yes	****	E	Land: *** Capital: ***** Skills:***	No labour contracts for wage workers	*****	***
	Engage in fingerlings hatching	Yes	Yes	****	M	Land: *** Capital: ** Skills:*****	No labour contracts for wage workers	****	***
	Fish Feed formulation	Yes	Yes	****	M	Land: ** Capital: *** Skills:**	No labour contracts for wage workers	****	**
Mango VC	Value addition of mangoes	Yes	Yes	*****	E	Land: * Capital: **** Skills:**	No labour contracts for wage workers	******	**
	Establish mango seedlings beds	Yes	Yes	*****	E	Land: **** Capital: *** Skills:***	No labour contracts for wage workers	*****	**

Mango VC	Provi-sion of spraying services	Yes	Yes	****	M	Land: Capital: ** Skills:**	Contam-inatio-on of spraying chemi-cals	****	**
	Establish mango collection centres	Yes	Yes	****	E	Land: ** Capital: ***** Skills:**	No supply contracts	****	**

4.1.4 Upgrading strategies and corresponding concrete recommendations for each node of the value chain in Siaya County taking into account both the opportunities and the constraints

For all value chains	Upgrading strategies recommendations
General	• **Train youth as community-extension workers to provide paid for services** to farmers in the four value chains identified. • **Support a more coordinated approach by service providers - government and non-government to enhance value addition** activities in all the Value Chains to enhance opportunities the youths can engage in. • **Increase VC specific BDS and youth-targeted BDS** such as VC farming and management, group management, leadership, financial management, marketing etc Passing of Agriculture bill currently in county parliament • **Create awareness among the youth on** the benefits of agribusiness as a worthwhile income earner for youth • **Provide wholesome BDS on business management** - leadership, group dynamics, financial management, marketing etc. • **Enhance the budgetary allocation and extension services** government agricultural programs • **Encourage youth group-based investments** and support to harness synergies and economies of scale • **Frequent financial education** to demystify access to finance and remove the fear of borrowing • **Improve access to market information and dissemination:** producers do not have systematic ways of accessing information on commodity prices and market opportunities to improve the situation. Development partners could support the youth to establish platforms to link farmers with information on regular basis to enable them to respond more effectively to market needs

a) Poultry	
Value chain node	**Upgrading strategies recommendations**
Production	• **Increase investment in poultry production** through sensitization and access to support services • **Enhance availability** of relevant market information to inform production preferences • **Improve access to information and services by use** of producer groups to ensure wide and economical access to the information • **Facilitate contracting with uptakers for youth poultry produce** e.g. aggregators or distributors • **Facilitate access to quality and certified chick breeds** through provision of subsidies by government and development partners • **Support youth agripreneurs and youth groups in accessing skills and tools for** value chain specific production
Aggregation	• **Facilitate contracting with uptakers for youth poultry produce** e.g. distributors or processors • **Invest in aggregation pens** for grading and supply moderation.
Distribution	• **Facilitate** contracting with aggregators and processors for market assurance and supply moderation • **Provide BDS** on marketing and supply side activities
Processing	• **Establish a local poultry processing plant** to support production through guaranteed market and moderate on prices • **Support** Innovation in value addition and by-product processing e.g. in egg and feathers
Inputs	• Use market data to respond to value chain nodes demands • **Support** Innovation and input incubation through the county's numerous technical and non-technical institutions. • **Provide** BDS on chick species and requirements
b) Avocado	
Value chain node	**Upgrading strategies recommendations**
Production	• Shift from local to exotic species of avocado that have better yields and wide market • **Sensitize the youth to adopt** contract and leased farming to enable access non-traditional family sanctioned land • **Provide BDS on harvesting and postharvest activitie**s to minimize losses • **Facilitate access by youth to quality seedlings and other inputs** through provision of subsidies or seed capital.
Aggregation	• **Establish Market linkages** with marketers/processors • **Provide BDS on handling and logistical support** to access producers and sellers

Distribution	• **Sensitize youth to access value chain specific market information** already available, to influence action and reaction • **Sensitize and support the youth in adopting contracting** with aggregators and processors as uptakers
Processing	• **Champion the revival** of the Ramba fruit processing factory to uptake and moderate both price and supply as well as create decent employment opportunities for the youth • **Sensitize youth to engage in identified** value addition activities to ensure longevity and better returns
c) Fish	
Value chain node	**Upgrading strategies recommendations**
Production	• **Source for additional** capital investment by stakeholders to support necessity for participation of qualified support services • **Support youth to invest in cage and pond-based farming** which is easier to control and manage through provision of seed capital or affordable credit • **Enhance financial linkages for young agripreneurs and youth groups to enhance credit support**: strengthening of financial linkages will enhance credit provision opportunities to the youth • **Champion the youth to participate in Lake cleaning and weed removal initiatives** as well as the county government and support partners. This will minimize contamination hence more and healthy fish in the lake
	• **Encourage youth group-based investments** and support them to harness synergies and economies of scale. Group based investment is shared services e.g. security, quality control etc. • **Work in collaboration with the government for support** in security, inspection, surveillance, quality assurance etc. • **Sensitize youth through training, on contracting** with aggregators and processors
Aggregation	• **Sensitize youth through training, on contracting producers** to ensure continuous supply • **Support the youth to invest in infrastructure for cold storage facilities** • **Train the youth on quality control measures to adhere to during value addition** inorder to provide quality products that can be sold within and outside Siaya County
Distribution	• **Support the youth to invest in infrastructure for cold storage facilities**

Processing	• **Establish national and local processing initiatives and collaboration**: this can be through financing and technical support. These processing activities will create more decent employment opportunities for the youth • **Sensitize youth through training, on contracting producers** to ensure continuous supply • **Establish backward linkages to support other nodes** e.g. production and aggregation • **Train the youth on value addition and processing standards.** • **Utilize the local technical and financial service providers for provision of required financial services to the youth**
Value chain node	**Upgrading strategies recommendations**
Inputs	• **Increase research and data utilization to ensure youth targeted responses in the value chain** address inputs challenges identified. • **Encourage and facilitate the youth to provide better quality and economically viable fish seed stock and feeds** • **Promote local volume manufacture / fabrication of input items** e.g. cages, nets, • **Provide domesticated solutions** through utilization of the available government technology infrastructure e.g. ATDC and KIE • **Request for local and national** support to enhance water cleanup services.
d) Mango	
Value chain node	**Upgrading strategies recommendations**
Production	• **Increase farming of exotic mango species** which are fast maturing and high yielding • **Support youth to access high quality seedlings** through provision of subsidies and seed capital • **Encourage farmer groups to leverage on their numbers** for reduced cost of production and attract relevant BDS services • **Evaluate the existing processes and structures of leasing land** and contract farming with an aim of ensuring they are youth friendly
Aggregation	• **Provide BDS Training and upskilling** on postharvest and fruit movement activities • **Sensitize and support the youth in adopting contracting** with both producers and up-takers e.g. marketers • **Support the youth to invest in postharvest storage facilities** to minimize losses through provision of capital or affordable credit

Distribution/ marketing	• **Sensitize and support the youth in adopting contracting** with uptakers e.g. processors • **Provide BDS services** in marketing, data utilization etc
Processing	• **Champion the revival** of the Ramba fruit processing factory to uptake and moderate both price and supply as well as create decent employment opportunities for the youth • **Establish backward and forward linkages** with producers and sellers of finished products • **Encourage the youth to utilize** the local technical, financial and business support services to innovate on locally suitable processing solutions. • **Support youth innovation in value addition and post-harvest activities** e.g. drying and other processed fruit products
Value chain node	**Upgrading strategies recommendations**
Inputs	• **Collaborate with available technical and financial service providers** for localized solutions for affordable and quality inputs provisions • **Utilize existing market data** to assist in input configuration • **Encourage youth group-based investment** on high value input items and support them to harness synergies and economies of scale.

4.1.5 Youth access to financial services

a) Main providers of financial services and type of products sought by youth

The study established the main providers of financial service to be commercial banks, MFIs, Government agencies, NGOs, non-banking financial services providers such as SACCOs, digital providers and informal providers such as merry go round groups, table banking and informal lenders or shylocks. There were also a number of insurance companies in the two counties that provided insurance products to farmers.

The study established that the youth sought a number of financial services from financial institutions with loans and credit being most popular, followed by savings products, insurance, investment products and training and capacity building services.

b) Challenges faced by youth in accessing financial services

The main challenges faced by youth in accessing financial products and services included high costs of credit, perceived risk of using these services, lack of collateral, low awareness of these services, difficulties in accessing the services and other challenges such as too many requirements for accessing these products, lack of guarantors, lack of farmer friendly products and fear of harassment in case of loan default.

The study further established that only 41percent of the youth had requested for credit from financial institutions with only 28 percent of the requests being successful in Kakamega County. While in Siaya County, only 35 percent of youth had sought credit from financial institutions and only 31percent were successful.

4.1.6 Youth access to business development services

a) Main providers of BDS

The study found that the providers of BDS services in the Kakamega County consisted of three players, namely: National and County Government Agencies, Non-Governmental Organizations (NGOs) and religious organizations. It was noted that there were two main type of BDS services received by youth-business skills training and technical skills training. The most common areas of business skills training included training and support in; marketing and pricing, financial management, business plan writing, inventory management and investor readiness. The main providers of business skills training were banks and Micro Finance Institutions (MFIs) such as Kenya Women Finance Trust (KWFT), Equity Bank and Non-governmental Organizations (NGOs) such as Farm Africa, Anglican Development Services, Sustainable Organic Farming and Development (SOFDI) amongst others.Technical skills training consisted topics on; farm records management, use of certified seeds, livestock management practices, crop management practices and post-harvest management. The main providers of technical training to farmers were National and County Government institutions and private training institutions.

b) Demand for BDS

Results on demand for BDS revealed that the most sought after BDS service were market linkages followed by business mentorship, business training and financial linkages, business coaching, market development, acceleration support, incubation and other BDS services such as record keeping, proposal writing, marketing and pricing skills, investor preparedness and financial management.

The study findings revealed that the youth expressed the need for provision of BDS services as follows: Dairy VC - accessible and affordable AI services, financial linkages, training on feeds formulation and feeds conservation and provision of livestock extension services; Fish VC - need for financial linkages, training on ponds construction and feeds formulation and training on costing and pricing of products; Poultry VC - Training on business planning and capital raising, financial linkages, provision of extension services and market linkages and training on costing and pricing of products; Soyaa VC - financial linkages, training on business planning and capital raising and market linkages and training on costing and pricing of products; Mango VC - market linkages, training on mango grafting, capacity building on pests and diseases management and financial linkages; Avocado VC - training on avocado processing and value addition; training on establishment of tree nurseries for Hass variety seedlings, financial and market linkages and trainings on group formation and management.

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Appendices

Appenidx i: gross margin analysis for the priotized value chains

1. Avocado VC

a) Gross margin analysis for a small holder avocado farmer

Table 1: Gross margin analysis for grafted Avocadoes production per acre

Activity	Units	Qtty	Rate	1st Yr	2nd Yr	3rd Yr	4th Yr	5th Yr & other Yrs
Land Clearance	Days	25	500	12 500				
Digging holes	Holes	120	60	7 200				
Filling holes	Holes	120	60	7 200				
Spraying	Days	20	200	4 000	4 000	4 000	4 000	
Seedlings	Seedlings	120	150	18 000				
Manure	Bags	1	10 000	10 000			10 000	
Fertilizer	Bags	1	3 000	3 000			3 000	
Mulching	Days	120	10	1 200				
Planting	Seedlings	120	10	1 200				
Pesticides		1	3 000	3 000	3 000	3 000	3 000	3 000
Fungicides		1	2 000	2 000				
Herbicides		1	2 000	2 000				
Weeding	Days	8	300	2 400	2 400	2 400	2 400	2 400
Formative prunning	Trees	5	300	1 500				
Water costs	Trees	10	300	3 000	3 000	3 000	–	–
Avocado Harvesting	Days	35	200	–	–	7 000	7 000	7 000
Total Establishment Costs				**78 200**	**12 400**	**19 400**	**29 400**	**12 400**
Fruit Yields/ Tree				–	–	120	180	500
Fruit Yield/ Acre				–	–	14 400	21 600	60 000
Price per Fruit				–	5.00	5.00	5.00	5.00
Gross returns				–	–	72 000	108 000	300 000
Net Returns				(78 200)	(12 400)	52 600	78 600	287 600
Cumulative out/inflows				**(78 200)**	**(90 600)**	**(38 000)**	**40 600**	**328 200**

Source: Survey data

a) Avocado processing gross margin analysis

Table 2: Gross margin analysis for spraying services

No	Item	Quantity	Unit Price (K Sh)	Total Revenue (K Sh)
	Product			
1)	Avocado Juice	20litres	100	2 000
	Variable costs			
2)	Water	10 litres		100
3)	Ripe Avocados	25	10	250
4)	Labour	1	250	250
5)	Plastic tumblers	100	3	300
Total Cost				**900**
Gross profit per day				**1 100**
Gross Margin per day				**55%**
Estimated sales per day= 20 litres				
Gross margins for 1 month @ 25 working day				27,500

Source: Survey data

b) Gross margin analysis for avocado tree seedlings production

Table 3: Gross margin analysis for avocado tree seedlings production

No	Item	Quantity	Unit Price (K Sh)	Period	Total Revenue (K Sh)
	Product				
	Avocado seedlings	1 000	150		150 000
	Variable costs				
1.	Fuel (litres) for pumping water	10	100	4	4 000
2.	Avocado seeds	1 000	1	1	500
3.	Manure (40% of K Sh. 2,500 per pick-up)	1	625	1	625
4.	Seedbed propagators nets and sticks	1	2 000	1	2 000
5.	Labour-seedbed preparation	3	500	4	6 000
6.	Labour-potting	1 000	5	1	5 000
7.	Labour-mulching and weeding, Watering per month	1	6 000	1	6 000
8.	Seedling Pots	1 000	2	1	2 200
	Total Cost				**26 125**
	Gross profit per 4 months season				**123 875**

Source: Survey data

9. Mango value chain

a) Gross margin analysis for mango spraying

b) **Table 4:** Gross margin analysis for mango spraying

Item	Quantity()	Unit Price (K Sh)	Total Revenue
Revenue - Spraying of mango trees	100 trees	300	30 000
Variable costs			
Spraying Chemical (Thunder)	1(100ml)	850	850
Fuel	3Litres	120	360
Labour	4 casual workers	300	1200
Water	100 litres	1	100
Total Cost			**2 510**
Gross profit			27 490
Gross Margin (%)			91.6%

Source: Survey data

c) Gross margin analysis for mango processing

Table 5: Gross margin analysis for mango processing

No	Item	Quantity	Unit Price(K Sh)	Total Revenue (K Sh)
	Product			
	Mango Juice	20litres	100	2 000
	Variable costs			
1.	Water	5 litres		100
2.	Ripe Mangoes	40	8	320
3.	Labour	1	250	250
4.	Electricity	1	150	150
5.	Plastic tumblers	100	3	300
	Total Cost			**1 120**
	Gross profit per day			**880**
	Gross Margin per day (%)			**44%**
	Estimated sales per day= 20 litres			
	Gross profit for 1 month @ 25 days working day			22 000
	Less: Blender - one off	1	2 000	2 000
	Gross profit for 1st month			20 000

Source: Survey data

d) Gross margin analysis for mango tree seedlings production

Table 6: Gross margin analysis for mango tree seedlings production

No	Item	Quantity	Unit Price (K Sh)	Period	Total Revenue (K Sh)
	Product				
	Mango seedlings	1 000	150		150 000
	Variable costs				
1.	Fuel (litres) for pumping water	10	100	4	4 000
2.	Mango seeds	1 000	1	1	500
3.	Manure (40% of K Sh. 2,500 per pick-up)	1	625	1	625
4.	Seedbed propagators-nets and sticks	1	2 000	1	2 000
5.	Labour-seedbed preparation	3	500	4	6 000
6.	Labour-potting	1 000	5	1	5 000
7.	Labour-mulching and weeding, Watering per month	1	6 000	1	6 000
8.	Seedling Pots	1 000	2	1	2 200
	Total Cost				**26 125**
	Gross profit per 4 months season				**123 875**

Source: Survey data

9. Motorcycle business model

a) Gross margin analysis for a motorcycle owner

Table 7: Gross margin analysis for a motorcycle owner

Item	Quantity	Unit Price	Per month	Total Revenue/ year
Revenue motorcycle	**1**	**800**[1] **per day**	**20 000**	**240 000**
Expenses incurred				
Variable costs				
1. Fuel, service and maintenance	1	300	7 500	90 000
2. Levies, licenses and insurance	1	200	5 000	60 000
Total variable costs		**500**	**12 500**	**150 000**
Gross profit/Loss		**300**	**7 500**	**90 000**
Gross profit margin (%)				**37.5%**
Fixed costs				

Item	Quantity	Unit price	Per month	Total Costs-year 1
Motorcycle purchase[2] (Inclusive of finance costs)	1	108 000	4 500	54 000
Protective Gear	1	24 000	1 000	12 000
Total fixed costs		**132 000**	**5 500**	**66 000**
Net earnings Year 1			**2 000**	**24 000**
Wear & tear costs[3]			**1 400**	**16 800**
Net earnings			**600**	**7 200**
Net earnings (%) Year 1				**3%**

Source: Survey data

b) Gross margin analysis for a rider leasing a motorcycle

Table 8: Gross margin analysis for a rider leasing a motorcycle

Item	Quantity	Unit Price	Per month	Total Revenue/ year
Revenue motorcycle	**1**	**800 per day**	**20 000**	**240 000**
Expenses incurred				
Variable costs				
1. Fuel, service and maintenance	1	150	3 750	45 000
2. Levies, licenses	1	150	3 750	45 000
3. Leasing fee (paid for 24 day/month)	1	300	7 500	90 000
Total variable costs			**15 000**	**180 000**
Gross profit/Loss			**5 000**	**60 000**
Gross profit margin (%)				**25%**
Fixed costs (Recoverable in 1 year)				
Item	**Quantity**	**Unit Price**	**Per month**	**Total Costs/ year**
Protective gear	1	24 000	1 000	12 000
Total fixed costs			**1 000**	**12 000**
Net earnings			**4 000**	**48 000**
Net earnings (%)				**20%**

Source: Survey data

10. Fish value chain

a) Gross margin analysis for cage fish farming

Assumption: Fish to be harvested after 8 months

Table 9: Gross margin analysis for cage fish farming

Item	Quantity	Unit Price(K Sh)	Total Revenue
Revenue - Fish	1 800[4]	250	450 000
Variable costs			
Item	**Quantity**	**Unit Price(K Sh)**	**Total Revenue**
Tilapia Fingerlings (Monosex Tilapia)	2 000	10	20 000
Feeds	3 000 kg	70	210 000
Labour	200 days	250	50 000
Total cost			**270 000**
Gross margin			**180 000**
Gross Margin (%)			**40%**
Fixed costs			
Cage construction costs	1	120 000	120 000

Source: Survey data

b) Gross margin analysis for pond farming

This analysis is based on the following parameters;

1. Pond size 300 m^2
2. Fish species: Tilapia
3. Pond construction cost: 200 per m^2
4. Price of fish: Ksh 250
5. Production cycle length: 8 months
6. Survival rate for fingerlings is 90 percent

Table 10: Gross margin analysis for fish pond farming

Item	Quantity	Unit Price(K Sh)	Total Revenue
Revenue from sale of fish	1 350	250	337 500
Variable Costs (one off costs per cycle)			
Item	**Quantity**	**Unit cost**	**Total costs/cycle**
Fertilizer and lime	10 kg	300	3 000
Tilapia Fingerlings (Monosex Tilapia)	1 500	10	15 000
Feeds	2 000 kg	70	140 000
Labour costs	200 days	250/day	50 000
Total Variable Costs			**208 000**
Gross profit			**129 500**

Gross Margin (%)			**38.40%**
Fixed costs(incurred per cycle)			
Item	**Quantity**	**Unit cost(K Sh)**	**Total costs/cycle**
Pond construction total costs	300m^2	200	60 000

Source: Adapted from "A Guide to Profitable Fish Farming", Farm Africa (2019)

c) Gross margin analysis for fish value addition

Table 11: Gross margin analysis for fish value addition

Product	Kgs	Pierces	Price/ Pierce	Total revenue	Cost/Kg	Profit (K Sh)	Profit (%)
Catfish samosas	1	35	30	1 050	600	450	43%
Fried whole Tilapia (300g)	1	3	350	1 050	750	400	38%
Catfish fillet	1	10	80	800	600	200	25%
Catfish fingers	1	50	15	750	600	150	20%

Source: Adapted from "A Guide to Profitable Fish Farming", Farm Africa (2019)

11. Soya VC

a) Gross margin analysis for small scale farmer

This analysis is based on the following parameters;

i) Land size - 1 acre

ii) Production per 3-month cycle - Average 2000 kg

iii) Selling price per kg (grains) - K Sh. 50/= (lowest price offered)

iv) Selling price per kg (seeds) - K Sh. 100/=

v) Buying price for Seeds - K Sh.100/= from SOFDI in Kakamega

Table 12: Gross margin analysis for soya production for by a small-scale farmer

Item	Quantity	Unit Price(K Sh)	Total Revenue
Revenue from sale of Soya Beans	2 000	50	100 000
Variable costs (one off costs per cycle)			
Item	**Quantity**	**Unit cost(K Sh)**	**Total costs/cycle**
Cost of leasing of land	1 acre/season	5 000	5 000
Seeds	20 kg	100	2 000
Fertilizer /manure **(SSP, TSP and NPK)**	1	8 500	8 500
Labour - land preparation	1	3 000	3 000
Labour - ploughing	1	3 000	3 000

Item	Quantity	Unit cost(K Sh)	Total costs/cycle
Labour - planting	1	2 000	2 000
Labour - weeding	1	3 000	3 000
Spraying foliar	1	2 000	2 000
Pesticides	40	70	2 800
Labour - harvesting	1	2 000	2 000
Labour - threshing	1	2 000	2 000
Post-harvest drying and cleaning	1	2 000	2 000
Packaging	40	50	2 000
Transportation	40	100	4 000
Total variable costs			**43 300**
Gross profit			**56 700**
Gross margin (%)			**56.7%**

Source: Survey data

b) **Gross margin analysis for processing**

This analysis is based on the following parameters;

i) Production per 1kg of soybeans - 4 litres soya milk

ii) Buying price per kg (grains) - K Sh. 50/= (lowest price offered)

iii) Selling price per 1 litre of milk - K Sh. 60/=

Table 13: Gross margin analysis for soya value addition as an individual at home-Soya Oil

Item	Quantity	Unit Price (Ksh)	Total revenue
Revenue from sale of Soya oil per month @ 20litres per day for 26 days	520	250	130 000
Variable costs			
Item	**Quantity**	**Unit cost(K Sh)**	**Total costs/cycle**
Soya beans (@3 kg/1 litres production)	1 560 kg	45	70 200
Electricity @5/=/1 kg of beans	1 560	5	7 800
Total variable costs			**78 000**
Gross profit			**52 000**
Gross margin (%)			**40%**

Source: Stakeholder's validation workshop

12. Dairy value chain

Table 14: Gross margins analysis for milk dispensing enterprises (per month)

Particulars	Details
Milk volume (litres)	6 000
Cost (Ksh):	
Purchase price per litre	35
Labour	12 000
Rent	
Electricity	1 000
Lab services	
Cleaning	3 000
License fees	1 000
Maintenance	
Sales price per litre	60
Total cost of milk	**210 000**
Total variable cost	**227 000**
Total sales revenue	360 000
Gross Margin	133 000
Gross Margin per litre	22.16
Gross Margin (%)	36.9%

Source: Adapted from Dairy Value Chain Analysis, USAID-KAVES (2015)

Table 15: Costs and returns for producing and marketing of Boma Rhodes hay in the wet and dry seasons per acre

Item	Wet season	Dry season	Annual
Yield per acre (bales)	300	300	600
Price per bale (Ksh)	200	250	225
Gross output (Ksh)	***60 000***	***75 000***	***135 000***
Variable costs			
Planting materials/acre (Ksh)	7 000	–	7 000
Fertilizer	5 000	5 000	10 000
Harvesting and baling cost/acre	11 000	11 000	22 000
Hired labour (Land prep)	4 000	–	4 000
Family labour	1 500	1 500	3 000
Total	**28 500**	**17 500**	**46 000**
Gross margin	***31 500***	***57 500***	***89 000***
Other costs			
Other charges; Depreciation	1 210	1 210	2 420
Storage	2 600	2 600	5 200
Total	3 810	3 810	7 620
Net income	**23 880**	**49 880**	**73 760**

Source: Adapted from East Africa Dairy Development (EADD), Livestock Feeds and Production

Table 16: Costs and returns for producing and marketing of oat in the wet and dry seasons per acre

Item	Wet season	Dry season	Annual
Yield per acre (bales)	400	400	800
Price per bale (Ksh)	225	300	262.5
Seeds (90 Kg bags)	–	15	40
Price per bag	–	3 000	3 000
Gross output (Ksh)	**90 000**	**165 000**	**255 000**
Variable costs			
Planting materials / acre (Ksh)	13 500	–	13 500
Fertilizer	3 000	–	3 000
Transport costs (seeds, fertilizer)	450	–	450
Land preparation	4 500	–	4 500
Hired labour	2 250	2 250	4 500
Family labour	150	150	300
Harvesting and baling cost/acre	3 000	3 000	6 000
Harvesting and baling materials	2 950	2 950	5 900
Total	29 800	8 350	38 150
Gross margin	***60 200***	***156 650***	***216 850***
Other costs			
Other charges; depreciation	1 210	1 210	2 450
Storage	620	620	1 240
Rent (1 acre @ 5000 per year)	2 500	2 500	5 000
Total	4 330	4 330	8 660
Net income	**55 870**	**152 320**	**208 190**

Source: Adapted from East Africa Dairy Development (EADD), Livestock Feeds and Production

Table 17: Artificial inseminators' costs and returns per dose of local and imported semen

Item	Cost for 35 doses per day (K Sh)		Data source /remarks
	Local semen	**Imported semen**	**Local semen**
Price of semen from distributor/agent	250	250	Survey data.
Transport	200	200	Survey data
Price of Liquid Nitrogen per dose	2.19	2.19	KAGRC A 35 litre can of liquid Nitrogen has a capacity of 4000 doses. There for 1 dose uses 0.00875 litres. With a price of 1 litre of nitrogen being K Sh 250, this translates to K Sh 2.19 per dose

Item	Cost for 35 doses per day (K Sh)		Data source /remarks
Price of one Sheath	12	12	KAGRC K Sh 600 for 52 pieces, and each insemination uses 1, giving K Sh 11.53 per dose
Price of one glove	9	9	KAGRC K Sh 900 for 100 pieces, each piece used for one dose giving a cost of K Sh 9 per dose
Price of lubricant per dose	29	29	KAGRC Lubricant for K Sh 400 used for 14 days, therefore 1 dose is K Sh 29
AI kit depreciation per day	36	36	Calculated from KAGRC data*.
1. Total cost	537	1 141	Survey data
2. Sale price of semen to farmer	700	1 800	
3. Gross margin	163	660	

Source: Adapted from Dairy Value Chain Analysis, USAID-KAVES (2015)

Table 18: Agents/distributors costs and returns for 35 doses of local and imported semen

Item	Cost for 35 doses per day (K Sh)		Data source /remarks	
	Local semen	**Imported semen**	**Local semen**	**Imported semen**
Purchase of semen	7 000	12 250	Survey data. Semen from KAGRC bought at 200 per dose. The average number of doses in the year 2016 was 12,500, translating to 35 doses in a day	Survey data. Used the price of K Sh 350 per dose
Labour for distribution	500	500	Survey data	
Transport	200	200	Survey data	
Marketing costs	200	200	Survey data	
Liquid nitrogen	2 630	2 630	Survey data The average number of litres used in the year 2016 was 4800 litres, translating to K Sh 13.15 per day. The cost of one litre of nitrogen was K Sh 200	
1. Total cost	7 913	15 780		
2. Sale price of 35 doses to inseminator	8 750	31 500	Survey data. Used K Sh 250 per dose	Survey data. K Sh 900 per dose
3. Sale of nitrogen	3 288	3 288	Survey data. North Rift distributor in Trans Nzoia County used 4800 litres in 2016, translating to 13.15 litres per day at K Sh 250/ litre	
4. Total revenue	12 038	34 788		
5. Gross margin	1 508	19 008		

Source: Adapted from Dairy Value Chain Analysis, USAID-KAVES (2015)

1) Poultry Value Chain

Table 19: Gross margin analysis for Brooding one-day-old chicks for resale when at 2 months

Item	Quantity( )	Unit Price (Ksh)	Total revenue
Revenue from sale of 2-month old chicks	200	250	50 000
Item	**Quantity**	**Unit cost (Ksh)**	**Total costs**
one-day-old chick survival rate of 90%	180	100	18 000
Feeds	180	50	9 000
Electricity	180	1	180
Vaccine	180	15	2 700
Labour	180	7	1 260
Water	180	2	360
Total variable costs			**31 500**
Gross profit			**18 500**
Gross margin (%)			**37%**

Source: Stakeholder's validation workshop

(Footnotes)

1 Makes about 16 trips per day at K Sh 50 per trip

2 The assumption is that the motor cycle will be purchased at K Sh 84 000 plus interest charges of K Sh 24 000 and the total cost inclusive of interest of K Sh 108 000 is repaid over two years.

3 Wear and tear costs at computed on cost of purchasing the motor cycle at K Sh 84 000 and spread over five years

4 It is assumed that survival rate for fish in the cage is about 90 percent.

Appendix ii: youth case studies in the prioritised value chains

County: **Kakamega**

Sub-county: **Khwisero**

Name of Group: **Khwisero Lead Farmers Forum**

Contacts: **Albert, Chairman of the Group**

Value Chain: **Soya**

Nature of Business: **Soya processing**

The soya processing plant was started in the year 2019 by Khwisero Lead Farmers Forum a CBO consisting of farmers drawn from Khwisero Sub-county in Kakamega County. Youth consist 10 percent of the membership of this group.



Photo: Albert demonstrating soya beans grinding

This plant was established after farmers were introduced to soya production by Sustainable Organic Farming Development Initiative (SOFDI) in 2019. The processing plant buys soya beans from the farmers and processes it into soya milk, soya yoghurt, and soya beverage drink and soya nuts. The plant processes 15–30 litres of yoghurt per day. The waste product after processing soya milk – known as Okara – is sold to animal feeds processors. The group also uses the okara to make mandazis by mixing it with wheat flour. The Okara is also the main ingredient for "Sossi Soya".

There is a growing market for soya nuts, milk, yoghurt and mandazis in the local area and the CBO is not able to meet the demand for soya milk and yoghurt since the soya beans supplied by farmers are not sufficient.

The processing plant has created job opportunities for youth and the youth are engaged as transporters of the soya beans to the factory from the collection centres. These engagements are informal.and without contracts. However, they are paid based on the distances covered and amount of soya transported.

County: **Kakamega**

Sub-county: **Ikolomani**

Name of Business: **Hilltop Dairy Farm**

Contacts: **Simiyu–0796006652**

Value Chain: **Dairy**

Nature of Business: **Production**

The dairy farm was started in December 2019. The firm sits on a one–acre piece of land and practices zero grazing and own fodder production. The farm has a total of 47 exotic Friesian cows; 23 of the cows are milked and 19 cows are on their dry period. The farm has two young bulls and 3 calves. Two of the calves are Holstein–Friesian. The firm is currently producing 400 litres of milk per day which translates to 17 litres/cow per day. Before the 19 cows were dried, the farm used to produce over 500litres of milk part of which is processed to milk yoghurt.

However, the yoghurt processing is plant is not fully operational due to inadequate milk supply. All the fresh milk is sold within the neighborhood and to some regular buyers. The farm formulates its own feeds using fodder grown within the farm and molasses obtained from a distillery company. The other inputs for feeds formulation obtained from Uganda. In the last 5 months, the farm has been financially stable having recouped all its initial investment.



Photo: Cows in the zero grazing segment



Photo: Some of the equipment in the farm

The firm has a total of twenty–five (25) employees, among whom 20 are youth, while five are non–youth. These employees are contracted on permanent terms and have been provided with medical insurance under NHIF. The pay for these staff is in the range K Sh. 10 000–15 000. Besides the firm also employs casusla who work in the field to grow fodder. The casuals earn K Sh 250–350 per day with no other benefits. The farm's director and manager are both male youth.

The main challenge facing the farm was on feed formulation. Feeds ingredients are too expensive and are hard to access especially during the COVID-19 lockdowns since the ingredients are obtained from Uganda and with the COVID-19 restrictions had become extremely expensive. To mitigate this challenge, the farm had come up with their own feed formulation to cut on the expense of buying from Uganda and the transport costs.

County**: Kakamega**

Sub-county**: Ikolomani**

Name of Business**: Hilltop Dairy Farm**

Contacts**: Simiyu–0796006652**

Value Chain**: Dairy**

Nature of Business**: Production**

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However, the yoghurt processing is plant is not fully operational due to inadequate milk supply. All the fresh milk is sold within the neighborhood and to some regular buyers. The farm formulates its own feeds using fodder grown within the farm and molasses obtained from a distillery company. The other inputs for feeds formulation obtained from Uganda. In the last 5 months, the farm has been financially stable having recouped all its initial investment.

County: Siaya

Sub-county: Alego Usonga

Name of Group/Business: Sparrow Processors

Contacts:

Value Chain: Avocado

Nature of Business: Processing

Sparrow Processors group was started in 2018 with the main activity being juice processing. It has 6 members: 3 male and 3 females. All members are youth aged between 18 and 35 years. They engage in processing avocado and other fruit juices like mango, passion, sugarcane, watermelon, beetroot and hibiscus.

During the juice making process, there are those tasks that are carried out by women and men. For instance, blending and serving is done by women while peeling, squeezing sugarcane juice using the sugarcane machine, distribution of juice to clients in offices and home deliveries are done by men.

For avocado juice, the group makes a minimum of 15 litres per day making total gross sales of K Sh. 2700/=. This is achieved by blending 10 medium sized avocados, water, sugar and lemon. The profit earned from the 15 litres is K Sh 2200/= per day which translates to K Sh 66 000/= per month. A glass of juice goes for K Sh 100/= and K Sh 50/= for the large and small glasses respectively.

Their shop offers employment to the youth, in both permanent and casual basis. Out of the six employees, who are members, 3 are permanent while the other 3 are casual. Casual workers are paid K Sh. 300/= per day while the permanent employees get between K Sh. 8 000–20 000 per month. They also offer employment indirectly to two suppliers who supply them with avocados thrice a week.

The challenges currently facing the group include; inadequate finance to mechanize the business in terms of purchasing commercial blenders and deep freezers, high perishability of avocado and avocado juice and seasonality of avocado crop leading to high prices during the low season.

To address these challenges, financial linkages to enable the group invest in commercial blenders and deep freezers need to be established, need more training and research on preservation of avocado juice and sensitizing the youth to engage in avocado aggregation during the high low season.

County: **Siaya**

Sub-county: **Bondo**

Name of Group: **Moyie Women Group**

Contact: **Florence Ochunga – 0715 897 448**

Value Chain: **Poultry**

Nature of Business: **Production and Vaccination**

Moyie Women Group started as a poultry vaccination group in 2015 but has now transformed into poultry production. It is registered with the Social Services. The group has 14 members: 4 youth and 10 non–youth. All the members are women.

When they were fully participating in poultry vaccination, their members benefited from the same in terms of increased incomes and consequently improved livelihoods. Before the onset of the corona virus pandemic, the group used to generate a total of K Sh. 60 000 by vaccinating 10 000 birds per vaccination. Vaccination charges per bird is K Sh. 5. The pandemic affected their business and their last income from vaccinating birds was in April 2020 where they made a total of K Sh. 27 810. This money was divided among members and was used to purchase 2–month–old chicks which they are still raising up to now. They attested that, through the vaccinations they have been carrying out, members know how to vaccinate their chicken leading to reduced mortality rate and increased production.

Some of the challenges faced by members include inadequate finance to expand and/ start processing activities along the value chain, high cost of feeds leading to increased cost of production and inadequate water for poultry production. Expansion is in terms of increasing the number of birds and purchase of feeds.

To address the challenges, financial linkages should be established to enable them access funds to expand their businesses, negotiate with financial institutions to offer affordable terms of loans in terms of reduction in interest rates and/offering manageable requirements for the youth, liaise with the county government to sink borehole in the area and offer more training on feed formulation and provision of feed mill and mixer to aid in the formulation. This will also create jobs for the youth as they will be involved in processing, packaging and marketing.

County: **Siaya** Sub-county: **Bondo**

Name of Business: **Gombe Mango Seedlings Ent.** Contacts: **Simeo Gombe 0716014939**

Value Chain: **Mango & Avocado** Nature of Business: **Fruit input**

Gombe Mango Seedlings Ent. was started in 2008 as a fruit and other trees nursery at Banga Beach in Bondo. The owner (Non–youth) has leased 1 ½ acre lake front land at Shs 10 000 per year. He deals in mangos, avocados, blue gum, cider, etc. He sells over 2 000 seedlings per year at between Shs 150 – 200 per piece, making him between Shs 300 000 and Shs 400 000 per year.



Mr. Gombe attending to his seedlings – Banga, Bondo



The avocado section at Mr. Gombe's nursery – Banga, Bondo

The business provides youth with employment and training opportunities in production, input and trading. The youth are engaged in transplanting, selling, watering, potting and weeding jobs on contract basis. Mr Gombe pays Shs 500 per day and provides lunch and tea. This lasts until the activity is completed. On average is employs 2–5 youth depending on the activity to be carried out and these are hired on casual basis.

Challenges faced by the business are; youth in the area are lazy and unreliable, there has been an instance of theft reported. The market is far – Bondo is 20km and Siaya is 40 km. The business requires continuous working capital. The land is leased, so it requires annual lease fees.

To address the challenges, there is need for more information from government or other players to advise on market availability and trends. Youth should be sensitized to participate in agribusiness as a job. There's need for more support from government bodies on quality of seedlings etc.

County: **Siaya**

Sub-county: **Rarieda**

Name of Business: **Ramba Fruit Processing**

Contacts: **Newton Obado 0733 669933**

Value Chain: **Mango**

Nature of Business: **Fruit Juice Production**

Ramba Fruit Processing Factory is a fruit juice making company located a short distance from Ndori town, Rarieda in Siaya County. The factory was established through funding by World Bank and GOK for the Ramba Fruit Producers and Marketers Coop Society which was started in 2013. The factory currently does juice extraction mostly for mangos through extraction of juice pulp. However, it has capacity to perform similar processing for several other fruits e.g. passion, pawpaw, avocados, guavas etc. It can also do mineral water filtration and bottling. It has operated intermittently, and currently it is not operational.



Mr. Obado, the manager, explaining a point



Some of the fruit labels used on the products

The factory was established to off take fruit produce during harvest seasons thereby guaranteeing both market and price stability. Alongside, it was supposed to create employment directly at the factory and through the value chain actors providing services. Further, a good market for the mangos and other fruits was meant to spur more production thereby creating more opportunities. When operational, the factory employs about 35 people at the factory majority of whom are youth and several hundreds more are engaged by the other VC actors and service providers.

The factory has faced challenges in low levels of capitalization as the Coop has not offered any capital. Further, it has not received sufficient support from the county government to enable it to operate smoothly. It currently has a strategic partner (Mr Emmanuel Acheyo–EA Industries Ltd) who has also faced technical, regulatory and financial challenges. The market was never a problem when in production but the capacity has never been fully utilized. Production level was at 5 000 litres of juice per day while the installed machine capacity is 50 000litres per day.

The factory has all it requires to operate. However, it requires local government support and goodwill to provide requisite documentation and also channel its agricultural value chain activities towards processing. Further, the factory needs capitalization to cushion initial obligations like logistics, salaries and operational expenses and also attract stakeholders. The factory has the capacity to increase significantly, activities in the various value chain nodes as it guarantees a stable market and prices for the actors.

County: **Siaya**

Sub-county – **Alego Usonga**

Name of Group/Business: **Pacho Farm**

Contacts: **George Onyango 0725 471402**

Value Chain: **Fish**

Nature of Business: **Fish Fingerlings**

The business carries out farming of tilapia fish fingerlings among other fish stock through hapa cages. The farm also has mangos, avocados, herbs, paw paws, local vegetables among others. They are about a year and a half old at the current location. They sell fish fingerlings to cage farmers, pond farmers and to a small extent, aquariuMs

The business employs mostly youth with 5 employed permanently. The farm coordinator is a youth. They also employ others on casual basis when there is a need e.g. during the digging of the pond etc. They provide a medical cover for the staff through a service provider arrangement. They also support other value chain actors through their numerous inputs in nets, feeds, liners etc.



Challenges facing the business: The business was recently flooded by the unusually long rains and lost stock worth over a million shillings. Fish feed is expensive. There are no specially trained workers for the different activities. County government support is low. They have to do their own extension services which are expensive. Capital for expansion is needed

To overcome the challenges, the farm is developing their own fish feed formula, but research is incomplete. They have been training their own staff and motivating them with incentives. They do their own extension services to educate fish farmers about proper practices.

Appendix iii: terms of reference for the assignment

1 INTRODUCTION

1.1 Background

Achieving food security for all is at the heart of the FAO's efforts to make sure people have regular access to enough high-quality food to lead active, healthy lives. In this regard FAO's three main goals are: the eradication of hunger, food insecurity and malnutrition; the elimination of poverty and the driving forward of economic and social progress for all; and the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations. FAO's focuses on addressing issues related to improved agricultural productivity, enhancing and diversifying rural employment opportunities, especially for women and youth, helping the poor better manage risks through social protection, leveraging remittances for investments in agriculture and rural development and improving management of natural resources thus reducing conflicts over access to scarce land and water resources.

1.2 Integrated Country Approach (ICA) Project

The Integrated Country Approach for boosting decent jobs for youth in the Agrifood system "ICA project" is an FAO Project that seeks to support countries in adopting and implementing more youth-inclusive Agrifood system development policies, strategies and programmes. Its ultimate objective is to reduce rural poverty and distress migration among rural young women and men by reducing unemployment and underemployment. With more than 70 million unemployed youth worldwide and 156 million young workers living in poverty, youth employment is a top policy concern. Between 2015 and 2030, the combined population of Africa and Asia is projected to increase from 5.6 billion to more than 6.6 billion. In the same period, the number of people aged 15–24 years is expected to grow by about 100 million to 1.3 billion worldwide. Almost all of that increase will take place in sub-Saharan Africa (SSA), and particularly in rural areas, where the lack of decent employment opportunities is a common cause of poverty, food insecurity, and distress migration.

In Kenya, the objective of the ICA project, as with the ICA projects in the other countries, is to create decent employment opportunities (wage/self-employment) for youth in the agricultural sector. In order to create youth employment opportunities, ICA-Kenya plans to adopt value chain development approaches in two counties (Kakamega and Siaya), and implement a youth championship programme nationwide. While the former makes direct interventions to vulnerable youth who are currently unemployed, the latter targets successful youth agripreneurs running innovative agribusinesses, who are expected to inspire other youth by becoming role models and mentors for them.

1.3 Target beneficiaries of ICA-Kenya Project

In line with the definition of youth by the government of Kenya, the ICA project targets persons aged between 18 and 35. However, granted that in Kenya, youth above 16 are legally allowed to work, the project will include youth aged 16–18 and this group will benefit from some interventions.

1.4 Youth-specific and gender-sensitive value chain analysis

The youth-specific and gender-sensitive value chain analysis (including a market assessment) has the objective to assess the current engagement of youth in the specific value chains, as well as the specific challenges that youth face and the opportunities that could be tapped into for the generation of more and better jobs. The study will identify key issues, bottlenecks and leverage points in the selected value chains and propose a vision which will form the basis for a upgrading strategy with practical/actionable points which considers the triple bottom line of sustainability (economic, social and environmental) and improve opportunities for decent rural youth employment in the selected value chains, whether in self or wage employment. Special emphasis will be placed on youth access to finance.

1.5 Scope of work

The scope of this study is as detailed below. Essentially, the study will seek to:

- Establish the target value chains in the two counties, size of the markets and potential for job creation and decent rural employment opportunities for youth. FAO has identified potential value chains (VCs) dairy and poultry in Kakamega; poultry, mango, avocado, and fish in Siaya. These VC will require validation.
- Development of an upgrading strategy and action plan, to be validated by all relevant stakeholders for a youth-centereddevelopment of the target value chains in Kakamega and Siaya.

The value chain report will:

- Provide maps of the value chains, showing physical and financial flows and key players, including identifying the potentially suitable youth and youth groups and private sector players working in the target value chains;
- Provide key statistics and synthetic information on end markets for each value chain, market dynamics and opportunities; Actors' contribution to changes in prices along the value chain; Competitiveness of the value chain(s), determining how to create competitive advantages for the targeted sectors in the context of local and regional trends, having in mind the context of the youth population;
- Assess and describe the current level of youth engagement in each core value chain function (production, aggregation, processing and distribution), with focus on the challenges that the youth face, the most common business models/production methods that they adopt and the employment and working conditions that they face such as (employment status, type of contracts for wage workers, formality/informality, access to social security, pay levels, application of occupational safety and health measures);
- Assess in detail the current access to finance of the rural youth in the targeted areas and value chains (through desk research and primary data collection - i.e. focus group discussions); Collect key data from the supply of financial services: a) Financial Institutions (formal and informal - including insurance and leasing provision) active in the selected counties with presence of branch network; b) assessment of available financial products suitable for rural youth and young agripreneurs uptake (i.e. length of the tenure, customized payments); c) existence of digital finance players providing youth agrifinance service (input finance, trade or other finance); d) mapping any other initiative in the selected counties promoting access to finance to rural youth; highlighting any other form of financial arrangements in the selected value chains (i.e. contract farming);
- Evaluate the demand of financial services from the rural youth in terms of: a) level of youth information on the existing financial products (financial literacy), b) level of collateral available, c) presence of financial footprints; d) level of unmet financial needs;
- Assess in detail the supply of non-financial service, as public and/or private Incubators and other business development services (BDS) accessible for the rural youth engaging the agribusinesses in the selected areas;
- Appraise the demand of non-financial service from the rural youth and agripreneurs (i.e. training, in business planning and market linkages);
- Identify the major capacity gaps within the Financial Institutions dealing with the rural youth and vice versa that may be object of FAO interventions;
- Assess the supply and demand of value chain support services and their capacity to address youth needs (e.g. seeds provision, agro-inputs access, financial services, etc.) Consider providers targeting youth explicitly or providing youth-inclusive services;
- Identify promising value chain business and employment opportunities for Youth Employment in each node of the value chain as well as in service provision;

- Provide an overview on the enabling environment for youth engagement in the selected value chain (national policies, regulations and laws; informal sociocultural elements such as norms, unwritten codes of conduct, cultural preferences and habits to take into consideration in developing the value chains; physical infrastructural elements such as energy, roads, ports, water, and telecommunication networks; Mechanization, ICT and digital agriculture; organizational and cooperation);
- Assess value chain (s) governance and youth representation within governance mechanisms;
- Identify systemic constraints and upgrading opportunities including recommendations (intervention matrix); i) Root causes of constraints limiting the generation of decent jobs for youth in the selected value chains (explaining which ones are common to the different VCs and which ones are specific to each of them), ii) Leverage points and upgrading opportunities for youth employment and decent work promotion, iii) SWOT analysis of each value chain in terms of youth participation in different value chain segments and service provision;
- Annex at least two examples/case studies of two concrete youth experiences in each node of the value chain, with pictures, taking note that the information presented should be gender-sensitive and assess the specific challenges faced by young women, and specific categories of youth like younger youth below 18, less skilled rural youth, eventual migrant youth, etc.).

Appendix iv: data collection tools

1) Individual Farmer Questionnaire

My name is _____and I am working as an Enumerator for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing the Integrated Country Approach (ICA) Project to boost decent jobs for youth in the agrifood system in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in this survey because you are a farmer in the _____value chain in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from farming activities. The survey will take about 50 minutes. Can we proceed with the interview? Do you have any questions?

Section A: Socio–Demographic Characteristics			
No	**Question**	**Responses**	**Response code**
1)	County		
2)	Sub county		
3)	Ward		
4)	Name of farmer		
5)	Sex of respondent	1 = Male 2 = Female	
6)	Age bracket	1 = Less than 18 2 = 18–25 3 = 26–30 4 = 30–35 5 = above 35	
7)	Highest level of education	1 = None/did not attend school 2 = Lower primary (1–4) 3 = Upper primary (5–8) 4 = Secondary school 5 = Post –secondary/TVET 6 = College/University 7 = Post graduate qualification	
8)	What is the size of your household?	_____	

<table>
<tr><td>9)</td><td>What is the main crop that you farm or livestock / fish product that you keep?</td><td>1 = Avocado
2 = Mango
3 = Fish
4 = Poultry
5 = Dairy
6 = Other (specify) _____</td><td></td></tr>
<tr><td colspan="4">Section A: Socio–Demographic Characteristics</td></tr>
<tr><td>10)</td><td>What is your main source of income</td><td>1 = Salary/wages
2 = Rental Income
3 = Business
4 = Farming income
5 = Remittances/donations
6 = Allowances for the elderly
7 = Pension
8 = Other (specify) _____</td><td></td></tr>
<tr><td colspan="4">Section B: Human Resources of the Farm</td></tr>
<tr><td>11)</td><td>Do you have contributing family workers supporting you on the farm? How many? And how many below 35?</td><td>1= Yes (specify how many in total, and how many below 35)
<table><tr><td>Numbers</td><td>Less than 35 years</td><td>More than 35 years</td></tr><tr><td></td><td></td><td></td></tr></table>2: No</td><td></td></tr>
<tr><td>12)</td><td>Do you also hire workers on the farm? How many workers do you employ? How many of these are permanent/full-time? How many are seasonal/ casual? What is the age group of these workers?</td><td><table><tr><td rowspan="2">Workers</td><td rowspan="2">Men</td><td rowspan="2">Women</td><td colspan="3">Age</td></tr><tr><td>16–17</td><td>1 8 – 35</td><td>Above 35</td></tr><tr><td>Permanent/ Full time</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Seasonal/ Casual</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>13)</td><td>Do the full-time employees have a written contract?</td><td>1 = Yes
2= No</td><td></td></tr>
<tr><td>14)</td><td>Do the casual workers/seasonal have a written contract?</td><td>1 = Yes
2= No</td><td></td></tr>
</table>

<table>
<tr><td>15)</td><td>Do you recruit migrant workers? For which tasks? Do their family members usually come with them and work on the farm?</td><td>1 = Yes, specify tasks_____
2= No</td><td></td></tr>
<tr><td>16)</td><td>Do youth below 18 do the same tasks as the other workers? Which tasks in particu-lar?</td><td>1= Yes, Specify tasks_____
2= No</td><td></td></tr>
<tr><td colspan="4">Section B: Human Resources of the Farm</td></tr>
<tr><td>17)</td><td>As for seasonal / casual workers, for how long are their usually recruited? (e.g. how many months per year)</td><td>Duration_____</td><td></td></tr>
<tr><td>18)</td><td>(If possible) Specify average wage for a permanent employee and for seasonal workers on the farm</td><td>Amount (Ksh)_____</td><td></td></tr>
<tr><td>19)</td><td>If you do hire youth, what are the main activities that youth carry out on the production level?</td><td>Specify the activities in the table below based on the difference between young women and men?
<table><tr><td>Activity</td><td>Men</td><td>Women</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table></td><td></td></tr>
</table>

<table>
<tr><td>20)</td><td>Are there activities on the farm where only (or mainly) young women/women are engaged? Are there activities where only/mainly young men are engaged?</td><td>1= Yes, please describe_____
_____
2= No, please describe_____
_____</td><td></td></tr>
<tr><td>21)</td><td>Do you have any specific plan to employ more youth workers in the future? If yes, for what kind of jobs/tasks, in particular? What are the soft and technical skills needed for those jobs?</td><td>1. Yes, specify tasks and skills needed
<table><tr><th>Tasks</th><th>Skills</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>2. No</td><td></td></tr>
<tr><td colspan="4">Section B: Human Resources of the Farm</td></tr>
<tr><td>22)</td><td>Do you have a special preference for hiring youth?</td><td>1 = Yes, reason_____
_____
2= No, reason_____
_____
3= I do not know</td><td></td></tr>
<tr><td>23)</td><td>Did you find specific challenges in hiring youth?</td><td>1 = Yes
2= No
3: I do not know</td><td></td></tr>
<tr><td>24)</td><td>If you answered Yes in question 23, please select the main challenges in hiring youth? Are challenges different between young women and young men? How?</td><td>1. They are not interested
2. They are not available locally
3. They are too expensive
4. They do not have the right skills
5. Others: specify</td><td></td></tr>
<tr><td>25)</td><td>How do you recruit youths usually? (through which channels?)</td><td>1 = Through referrals
2 = Recruiting from training institutions
3 = Adverts in local media
4 = Others, specify_____</td><td></td></tr>
<tr><td colspan="4">Section C1: Agricultural Production – Crops</td></tr>
</table>

<table>
<tr><td>1)</td><td>Do you or your family own land on which you farm on?</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>2)</td><td>What is the size of land owned by your family</td><td>_____acres</td><td></td></tr>
<tr><td>3)</td><td>Do you or your family have a title deed for your land?</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>4)</td><td>Is the title on your name?</td><td>1 = Yes
2= No</td><td></td></tr>
<tr><td>5)</td><td>What is the main source of water for farming activities?</td><td>1 = Rainfall
2 = Borehole
3 = Shallow wells
4 = Piped water from the river
5 = Others, specify</td><td></td></tr>
<tr><td colspan="4">Section C1: Agricultural Production – Crops</td></tr>
<tr><td>6)</td><td>Did you produce last season? Which crops did you produce last season?</td><td>1 = Yes
<table><tr><th>Crop</th><th>Type</th></tr><tr><td>Crop 1</td><td></td></tr><tr><td>Crop 2</td><td></td></tr><tr><td>Crop 3</td><td></td></tr><tr><td>Crop 4</td><td></td></tr></table>2 = No</td><td></td></tr>
<tr><td>7)</td><td>What influenced the crops that you produced?</td><td>1 = Market availability
2 = Price expectations
3 = Cost of inputs
4= Profit margins
5 = Favorable weather/climate
6 = Tradition
7 = Other, specify _____</td><td></td></tr>
<tr><td>8)</td><td>What type of seeds did you plant?</td><td>1 =Certified seeds
2 =Indigenous seeds
3 = Mixture of both
4 = Other</td><td></td></tr>
</table>

<table>
<tr><td>9)</td><td>What kind of inputs do you use for your product? How do you get them?</td><td><table><tr><th>Input</th><th>How Do you Acquire</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>10)</td><td>What are the main challenges related to the access of inputs?</td><td>1. Lack of information/
2. Lack of financial means
3. limited presence of inputs suppliers in the area
4. No formal relationship with the input suppliers.
5. Others (Please specify)</td><td></td></tr>
<tr><td>11)</td><td>Give reasons to why the challenges in question 9 above happen</td><td>1. _____
2. _____
3. _____
4. _____
5. _____</td><td></td></tr>
<tr><td colspan="4">Section C1: Agricultural Production – Crops</td></tr>
<tr><td>12)</td><td>Do you use any kind of specific technology or good farming practices (GAP) for your farming production (irrigation, pest management, etc.)? Which?</td><td>1= Yes, specify them_____
_____
2= No</td><td></td></tr>
<tr><td>13)</td><td>What are the specific challenges faced when using GAPs? How to address those challenges? Explain</td><td><table><tr><th>Challenges</th><th>Addressing the Challenges</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>14)</td><td>What is the main source of water for farming activities?</td><td>1 = Rainfall
2 = Borehole
3 = Shallow wells
4 = Piped water from the river
5 = Others, specify</td><td></td></tr>
<tr><td>15)</td><td>How many production cycles do you have per year and per crop?</td><td></td><td></td></tr>
</table>

<table>
<tr><td>16)</td><td>How much did you harvest?</td><td><table><tr><th>Crop</th><th>Type</th><th>Quantity in Kg</th></tr><tr><td>Crop 1</td><td></td><td></td></tr><tr><td>Crop 2</td><td></td><td></td></tr><tr><td>Crop 3</td><td></td><td></td></tr><tr><td>Crop 4</td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>17)</td><td>How much of the harvested crop did you sell?</td><td><table><tr><th>Crop</th><th>Type</th><th>Quantity in Kg</th></tr><tr><td>Crop 1</td><td></td><td></td></tr><tr><td>Crop 2</td><td></td><td></td></tr><tr><td>Crop 3</td><td></td><td></td></tr><tr><td>Crop 4</td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>18)</td><td>Which channels did you use to sell the crops?</td><td>1= Through a farmer organization
2 = Through a middle– man/broker
3 = Sold at my farm gate
4 = Sold at the open market or other place
5 = Sold through mobile phone
6 = Online marketing/ecommerce
7 = Others, specify</td><td></td></tr>
<tr><td colspan="4">Section C1: Agricultural Production – Crops</td></tr>
<tr><td>19)</td><td>If you did not sell any of the products, what is the reason for this?</td><td>1 = No surplus to sell/ post-harvest losses
2 = Did not want to sell/home consumption only
3 = Market price was not attractive
4 = No market to sell
5 = Produce was poor quality
6 = Others, specify</td><td></td></tr>
<tr><td>20)</td><td>How much did you receive from sale of the crop in Kenya shillings?</td><td><table><tr><th>Crop</th><th>Type</th><th>Amount (K Sh)</th></tr><tr><td>Crop 1</td><td></td><td></td></tr><tr><td>Crop 2</td><td></td><td></td></tr><tr><td>Crop 3</td><td></td><td></td></tr><tr><td>Crop 4</td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>21)</td><td>How did you decide on the price to sell your crop products?</td><td>1 = price offered by buyer
2 = price decided by broker
3 = negotiated on the price based on market rates
4 = Used an arbitrary price
5 = other (specify)</td><td></td></tr>
</table>

<table>
<tr><td>22)</td><td>Rating of High season versus lower season price</td><td><table><tr><th>Season</th><th>Rating</th></tr><tr><td>High</td><td></td></tr><tr><td>Low</td><td></td></tr></table></td><td></td></tr>
<tr><td>23)</td><td>Do you think the price you sold your crop at was fair</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>24)</td><td>Did you experience any difficulties selling the crop? If yes which ones?</td><td>1= Yes, Which ones from the below reasons
▪ 1 = Lack of market
▪ 2 = Low prices in available markets/unpredictable prices
▪ 3 = High cost of transport/poor infrastructure
▪ 4 = Lack of price information
▪ 5 = Inability to meet quality requirements by buyers
▪ 6 = Lack of support from FBO in selling produce
▪ 7 = Late payment from buyers
▪ 8 = Others, specify_____
2= No</td><td></td></tr>
<tr><td colspan="4">Section C2: Agricultural Production – Livestock</td></tr>
<tr><td>25)</td><td>Do you keep livestock? What type of livestock do you keep?</td><td>1 = Livestock 1
2 = Livestock 2
3 = Livestock 3</td><td></td></tr>
<tr><td>26)</td><td>What kind of livestock breed do you keep?</td><td>1 = Pure/Improved breeds 1
2 = Crossbreed 2
3 = Local breeds 3
4 = Others, specify_____</td><td></td></tr>
<tr><td>27)</td><td>What kind of feeds do you give your livestock?</td><td></td><td></td></tr>
<tr><td>28)</td><td>What type of outputs do you sell from your livestock? How much of each product do you sell on average? What is your most sold product?</td><td>1 = milk
2 = eggs
3 = Live animals
4 = Others, specify_____</td><td></td></tr>
</table>

<table>
<tr><td>29)</td><td>Which channels did you use to sell the livestock products?</td><td>1= Through a farmer organization
2 = Through a middle– man/broker
3 = Sold at my farm gate
4 = Sold at the open market or other place
5 = Sold through mobile phone
6 = Online marketing/ecommerce
7 = Others, specify_____</td><td></td></tr>
<tr><td>30)</td><td>If you did not sell any of the products, what is the reason for this?</td><td>1 = No surplus to sell
2 = Did not want to sell/home consumption only
3 = Market price was not attractive
4 = No market to sell
5 = Produce was poor quality
6 = Others, specify_____</td><td></td></tr>
<tr><td>31)</td><td>How much did you received from sale of livestock products?</td><td>1 = Livestock 1
2 = Livestock 2
3 = Livestock 3</td><td></td></tr>
<tr><td>32)</td><td>How did you decide on the price to sell your livestock products</td><td>1 = price offered by buyer
2 = price decided by broker
3 = negotiated on the price based on market rates
4 = Used an arbitrary price
5 = other (specify)</td><td></td></tr>
<tr><td colspan="4">Section C2: Agricultural Production – Livestock</td></tr>
<tr><td>33)</td><td>How much did you receive from sale of the livestock in Kenya shillings?</td><td><table><tr><th>Crop</th><th>Type</th><th>Amount (K Sh)</th></tr><tr><td>Livestock 1</td><td></td><td></td></tr><tr><td>Livestock 2</td><td></td><td></td></tr><tr><td>Livestock 3</td><td></td><td></td></tr><tr><td>Livestock 4</td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>34)</td><td>How did you decide on the price to sell your livestock products?</td><td>1 = price offered by buyer
2 = price decided by broker
3 = negotiated on the price based on market rates
4 = Used an arbitrary price
5 = other (specify)</td><td></td></tr>
</table>

<table>
<tr><td>35)</td><td>Rating of High season versus lower season price</td><td><table><tr><th>Season</th><th>Rating</th></tr><tr><td>High</td><td></td></tr><tr><td>Low</td><td></td></tr></table></td><td></td></tr>
<tr><td>36)</td><td>Do you think the price you sold your livestock at was fair</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>37)</td><td>Did you experience any difficulties selling the livestock products?</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>38)</td><td>What major difficulty did you face when selling the livestock products?</td><td>1 = Lack of market
2 = Low prices in available markets/unpredictable prices
3 = High cost of transport/poor infrastructure
4 = Lack of price information
5 = Inability to meet quality requirements by buyers
6 = Lack of support from FBO in selling produce
7 = Late payment from buyers
8 = Others, specify_____</td><td></td></tr>
<tr><td colspan="4">Section D: Post Harvest Management</td></tr>
<tr><td>1)</td><td>Did your crop incur any damage during storage</td><td>1 = Yes
2 =No</td><td></td></tr>
<tr><td>2)</td><td>What percentage of the harvested crop was damaged during storage?</td><td>_____ %</td><td></td></tr>
<tr><td>3)</td><td>What caused the damage during storage?</td><td>1 = Rats/mice
2 = Pests/insects
3 = Molds
4 = Aflatoxin
5 = Not applicable</td><td></td></tr>
</table>

4)	How did you store the crop after harvesting?	1 = In a dry well– ventilated store 2 = In a traditional granary 3 = Indoors –in bags/baskets 4 = Indoors –open storage 5 = Outside –open storage 6 = Other (specify) _____	
5)	How do you propose to address the post-harvest losses?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
6)	How could youth be involved in addressing/ solving this issue?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
7)	Did you dry the crop after harvesting?	1 = Yes 2 = No	
8)	How did you dry the crop?	1 = Spread on the ground 2 = Spread on tarpaulins or other material 3 = By mechanical means/driers 4 = Other means (specify) _____	
Section D: Post Harvest Management			
9)	What other activities did you carry out to improve the quality of the crop	1 = sorting the crop to remove foreign matter 2 = remove broken grains 3 = remove discolored grains 4 = packaged the commodity 5 = Other (specify)_____ 6 = None	
Section E: Access to Finance			

1)	What are the names of the formal financial institutions available in your county that serve farmers like you?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
2)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain_____	
3)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain	
4)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Costs being too high 6 = Others, please explain_____	
5)	What type of products or services would you wish to see provided by these institutions?		
Section E: Access to Finance			
6)	What are the names of the informal financial institutions available in your county that serve farmers like you?		

7)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain_____	
8)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain_____	
9)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Costs being too high 6 = Others, please explain_____	
10)	What type of products or services would you wish to see provided by these institutions?		
11)	What digital finance providers are you aware of in your county?		
12)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain_____	
Section E: Access to Finance			

13)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others, please explain_____	
14)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Very high interest costs 6 = Others, please explain_____	
15)	What type of products or services would you wish to see provided by these institutions?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
Section F: Access to training and business development services (BDS)			
1)	Have you been trained in any of the following?	1 =Use of certified seeds; 2 =Good crop management practices 3 =Good livestock management practices 4 =Keeping of farm records 5 =Post-harvest management 6 =Marketing and price setting 7 =Business plan writing 8 =Investor preparedness 9 =Book– keeping 10 =Inventory management 11 =Financial management 12 = Others, specify	
2)	Who provided the training?		

3)	What type of training was it?		
Section F: Access to training and business development services (BDS)			
4)	What kind of training would you still need more urgently?		
5)	What challenges do you face in accessing the training that you need?	1 = Lack of awareness 2 = Costs, not able to afford 3 = Lack of local providers 4 = Limited knowledge 5 = Lack of time 6 = Low literacy level 6 = Others, please explain_____	
6)	Have you received the following BDS services?	1 = Business mentorship 2 = Coaching 3= Incubation (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 4 = Acceleration support (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 5 = Market linkage support 6= Training 7= financial linkage 8= market development 9= Others, please explain_____	
7)	Who provided the BDS?	1. _____ 2. _____ 3. _____ 4. _____	
Section F: Access to training and business development services (BDS)			

8)	What kind of BDS would you still need more urgently?	1 = Business mentorship 2 = Coaching 3= Incubation (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 4= Acceleration support (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 5 = Market linkage support 6= Training 7= financial linkage 8= market development 9= Others, please explain_____	
9)	What challenges do you face in accessing these BDS?	1 = Lack of awareness 2 = Costs, not able to afford 3 = Lack of local providers 4 = Limited knowledge on the use of BDS 5 = Lack of time 6 = Others, please explain_____	
Section G: Occupational Safety and Health (OSH)			
1)	What are the main hazards in this business?	List the most common ones 1. _____ 2. _____ 3. _____ 4. _____	
2)	Was there any OSH accident on the farm this year?	1 = Yes, please describe_____ _____ 2 = No	
3)	Do you adopt any OSH measures on the farm to prevent hazards?	1. Yes, please provide examples_____ _____ _____ 2. No	
Section G: Occupational Safety and Health (OSH)			

4)	For instance, in the Covid-19 situation, what did you do to inform and protect workers?	List ways you used to inform and protect workers 1. _____ 2. _____ 3. _____ 4. _____	
5)	Are there any measures that you are planning to implement but were not yet able to?	1 = Yes 2 = No	
6)	If Yes to the above indicate why	1 = Costs, not able to afford 2 = Lack of local providers or protective equipment (ex. masks) 3 = Lack of training or support centres 4 = Lack of time 5 = Others, please explain_____	
Section H: Extra Questions on Youth Opportunities			
1)	Do you think there is sufficient "space" for newcomers (youth) to production?	1 = Yes 2 = No	
2)	If the answer is No in question 1 above, state the reasons	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
3)	Would you be willing to mentor other youth that want to engage in production as farmers?	1 = Yes 2 = No	
4)	If the answer is No in question 3 above, state the reasons	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	

Section H: Extra Questions on Youth Opportunities			
5)	What are the services that you need and for which you stand ready to pay a price? List them (ex. Technical advice; vaccination services, etc.)	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
6)	Do you think that the provision any of the above services could represent an entrepreneurship opportunity for some youth?	1 = Yes, explain which ones 2 = No, why?	
7)	If the answer is No in question 6 above, state the reasons	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
8)	On the same line of thinking, are there untapped resources that could be used by the youth to create a new business?	1 = Yes 2 = No	
9)	If the answer is Yes in question 8 above, state the untapped resources that could be used by the youth to create a new business?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
10)	Is there any other use for instance of your product (ex. milk) that could be better harnessed? (e.g. by processing it).	1= Yes 2=No	

Section H: Extra Questions on Youth Opportunities			
11)	If the answer is Yes in question 10 above, state the other ways the products could be better harnessed?		
12)	Do you think there would be demand for the product?	1= Yes 2=No	
13)	Are there any challenges affecting youths in accessing opportunities in agriculture?	1= Yes 2= No	
14)	If the answer is Yes in question 12 above, state the challenges affecting youths	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	

2) Value Chain Actors Questionnaire – Aggregators, Processors Traders, Wholesalers & Input Suppliers

My name is _____ and I am working as a Consultant for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing The Integrated County Approach (ICA) Project to boost decent jobs for youth in the agrifood systems in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in the survey because you are an actor in the _____ value chain in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from activities in your value chain. The survey will take about 1 hour. Can we proceed with the interview? Do you have any questions?

Section A: Socio–demographic characteristics			
S/No.	**Question**	**Responses**	**Response code**

1)	County		
2)	Sub county		
3)	Ward		
4)	Name of respondent		
5)	Sex of respondent	1 = Male 2 = Female	
Section A: Socio–demographic characteristics			
6)	Age bracket	1 = Less than 18 2 = 18–253 = 26–30 4 = 30–35 5 = above 35	
7)	Highest level of education	1 = None/did not attend school 2 = Lower primary (1–4) 3 = Upper primary (5–8) 4 = Secondary school 5 = Post-secondary/TVET 6 = College/University 7 = Post graduate	
8)	What is the size of your household?	_____	
9)	Main occupation	1 = Aggregator 2 = Processor 3 = Distributor 4 = Transporter 5 = Retailer 6 = Wholesaler 7 = Consumer 8 = Others (specify)_____	
10)	What is the category of your business?	1 = Sole proprietor 2 = Partnership 3 = Private company 4 = Cooperative 5 = Youth group 6 = Others, please specify	
11)	Is your business registered/ formal?	1. Yes 2. No (explain why) 3. I am in the process of obtaining the registration	

12)	If not why?		
Section B: Type of products and services provided			
1)	What type of product or service do you deal in?	1 = Avocado 2 = Mango 3 = Fish 4 = Poultry 5 = Dairy 6 = Other (specify) _____	
2)	What is the frequency of purchase	1 = Daily 2 = Weekly 3 = Bi–monthly 4 = Monthly 5 = Quarterly 6 = Semi – annually 7 = Annually 8 = Others, specify	
3)	What is your buying price for the products?	1 = High season 2 = Normal season 3 = Low season	
4)	What is your selling price for the products	1 = High season 2 = Normal season 3 = Low season	
5)	Where do you buy the products from?	1 = Individual farmers 2 = Farmer cooperatives 3 = Brokers 4 = Wholesalers 5 = Retailers 6 = Others, please specify	
6)	Do you have contracts with your suppliers?	1 = Yes 2 = No	
7)	To what extent are your suppliers reliable?	1 = Very reliable 2 = Reliable 3 = Somewhat reliable 4 = Unreliable 5 = Very unreliable	

<table>
<tr><td>8)</td><td>Why do you buy from these sources?</td><td></td><td></td></tr>
<tr><td colspan="4">Section B: Type of products and services provided</td></tr>
<tr><td>9)</td><td>Who do you sell to?</td><td>1 = Direct to individual consumers
2 = Hotels, institutions etc.
3 = Brokers
4 = Wholesalers
5 = Retailers
6 = Others, please specify</td><td></td></tr>
<tr><td>10)</td><td>Do you have storage facilities?</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>11)</td><td>Are you a member of a trade or association?</td><td>1 = Yes
2 = No</td><td></td></tr>
<tr><td>12)</td><td>How do you benefit from this membership?</td><td></td><td></td></tr>
<tr><td>13)</td><td>What are some of the challenges you face as an actor in this value chain?</td><td></td><td></td></tr>
<tr><td>14)</td><td>In your opinion, how can these challenges be addressed?</td><td></td><td></td></tr>
<tr><td colspan="4">Section B : Human Resources in your business</td></tr>
<tr><td>1)</td><td>How many workers do you employ? How many of these are permanent/full-time? How many are seasonal/ casual? What is the age group of these workers?</td><td colspan="2"><table>
<tr><th rowspan="2">Staff</th><th rowspan="2">Men</th><th rowspan="2">Women</th><th colspan="3">Age</th></tr>
<tr><th>16–17</th><th>18–35</th><th>Above 35</th></tr>
<tr><td>Permanent/ Full time</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Seasonal/Casual</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>2)</td><td>Do the full time employees have a written contract?</td><td colspan="2">1 = Yes
2= No</td></tr>
<tr><td>3)</td><td>Do the casual workers/ seasonal have a written contract?</td><td colspan="2">1 = Yes
2= No</td></tr>
<tr><td>4)</td><td>How many months per year are casual/seasonal workers usually employed?</td><td colspan="2"></td></tr>
</table>

5)	Do you employ migrant workers? Which tasks do they carry out?	1 = Yes 2= No
Section B : Human Resources in your business		
6)	Do you have contributing family workers supporting your business? How many? How many are below 35?	1= Yes 2= No
7)	Are there **youth below 18** among your family workers or among your hired workers?	1. Yes, in both groups 2. Yes, only among family workers 3. Yes, only among hired workers 4. No 5. I do not know
8)	Do youth below 18 do the same tasks as the other workers? Which tasks in particular?	–
9)	Do you have any specific plan to employ more youth workers in the future?	1. Yes, 2. No,
10)	If yes, for what kind of jobs/ tasks, in particular?	
11)	What are the soft and technical skills needed for those jobs?	
12)	How do you recruit your staff?	1 = Through referrals 2 = Recruiting from training institutions 3 = Adverts in local media 4 = Others, specify
13)	What is the average remuneration for staff in your business? Please distinguish between permanent employees and seasonal workers?	

14)	What other benefits do you provide to your staff?	1 = Social security 2 = Paid leave 3 =Housing 4 = Insurance 5 = Transport 6 = Others, specify	
Section B : Human Resources in your business			
15)	What is the education level for the majority of the fulltime staff? What is the education level for the majority of the casual staff?	1 = None/did not attend school 2 = Lower primary (1–4) 3 = Upper primary (5–8) 4 = Secondary school 5 = College/University 6=Post graduate	
Sub–section C1 – Aggregators specific questions			
1)	What products are you involved in aggregation?	1 = Avocado 2 = Mango 3 = Fish 4 = Poultry 5 = Dairy 6 = Other (specify) _____	
2)	What value addition activities do you carry out on these products?		
3)	How many aggregators operate in your area? How many of these are youth?		
4)	Do you have any contract with your suppliers?		
5)	What is the average volume of the products you purchase monthly? Does your demand vary throughout the year?		
6)	Do you have specific quality/size standards for your raw material?		

<table>
<tr><td>7)</td><td>Are you satisfied with the quality/amount of the raw materials? If not, how could the farmers improve the quality or quantity?</td><td></td><td></td></tr>
<tr><td>8)</td><td>What are the main costs associated with your operation?</td><td></td><td></td></tr>
<tr><td colspan="4">Sub–section C1 – Aggregators specific questions</td></tr>
<tr><td>9)</td><td>Please indicate below the usual buyers of your processed products and at which prices</td><td colspan="2"><table>
<tr><th>Main buyers of products</th><th>Volume</th><th>Price</th></tr>
<tr><td>Brokers/Middlemen</td><td></td><td></td></tr>
<tr><td>Wholesalers and retailers</td><td></td><td></td></tr>
<tr><td>Other processors</td><td></td><td></td></tr>
<tr><td>Exporting companies</td><td></td><td></td></tr>
<tr><td>Others (Specify)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>10)</td><td>Can you identify strengths and opportunities for business growth/ development on the aggregation level?</td><td colspan="2"></td></tr>
<tr><td>11)</td><td>What challenges do you face in the aggregation?</td><td colspan="2"></td></tr>
<tr><td>12)</td><td>Are there any threats to the sector development?</td><td colspan="2"></td></tr>
<tr><td>13)</td><td>What challenges do you face in accessing markets for your produce?</td><td colspan="2"></td></tr>
<tr><td>14)</td><td>Where do you get the necessary market information from</td><td colspan="2"></td></tr>
<tr><td>15)</td><td>? What channels do you use, or would you like to use?</td><td colspan="2"></td></tr>
<tr><td>16)</td><td>Is there any specific information that you miss and you would consider useful to have?</td><td colspan="2"></td></tr>
<tr><td>17)</td><td>If you imagine possible solutions to existing challenges in aggregation, do you think youth could play a role in overcoming those challenges? Could the latter offer them a new agribusiness opportunity?</td><td colspan="2"></td></tr>
</table>

<table>
<tr><td>18)</td><td>Are there opportunities in the aggregation business that could particularly favour young women?</td><td></td><td></td></tr>
<tr><td>19)</td><td>What is the % of youth among your buyers</td><td></td><td></td></tr>
<tr><td>20)</td><td>What strategies would you propose to increase youth engagement among your buyers?</td><td></td><td></td></tr>
<tr><td colspan="4">Sub–section C2 – Processors specific questions</td></tr>
<tr><td>1)</td><td>Which of these crops do you process the most? Why (why did you choose this certain business)?</td><td>1 = Avocado
2 = Mango
3 = Fish
4 = Poultry
5 = Dairy
6 = Other (specify) _____</td><td></td></tr>
<tr><td>2)</td><td>What products are you processing?</td><td colspan="2"><table>
<tr><th>Crop</th><th>Processed product 1</th><th>Processed product 2</th><th>Processed product 3</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>3)</td><td>What is the average volume of products processed annually?</td><td></td><td></td></tr>
<tr><td>4)</td><td>What is the source of raw materials?</td><td colspan="2"><table>
<tr><th>Source of raw material</th><th>Average price per Kg</th><th>% quantity sourced from your suppliers</th></tr>
<tr><td>Own source</td><td></td><td></td></tr>
<tr><td>Individual farmers</td><td></td><td></td></tr>
<tr><td>Cooperatives</td><td></td><td></td></tr>
<tr><td>Local markets</td><td></td><td></td></tr>
<tr><td>Youth organization</td><td></td><td></td></tr>
<tr><td>Others indicate</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>5)</td><td>Do you have any contract with your suppliers?</td><td></td><td></td></tr>
<tr><td>6)</td><td>What is the average volume of the raw material you purchase monthly?</td><td></td><td></td></tr>
<tr><td>7)</td><td>Does your demand vary throughout the year (high vs low season)?</td><td></td><td></td></tr>
</table>

<table>
<tr><td>8)</td><td>Do you have specific quality/size standards for your raw material?</td><td></td><td></td></tr>
<tr><td>9)</td><td>Are you satisfied with the quality/amount of the raw materials? If not, how could quality or quantity be improved?</td><td>1=Yes
2=No</td><td></td></tr>
<tr><td>10)</td><td>What are the main costs associated with your operation?</td><td></td><td></td></tr>
<tr><td colspan="4">Sub–section C2 – Processors specific questions</td></tr>
<tr><td>11)</td><td>Who buys your processed products and at which prices?</td><td colspan="2"><table>
<tr><th>Main buyers of products</th><th>Volume</th><th>Price</th></tr>
<tr><td>Brokers/Middlemen</td><td></td><td></td></tr>
<tr><td>Wholesalers and retailers</td><td></td><td></td></tr>
<tr><td>Other processors</td><td></td><td></td></tr>
<tr><td>Exporting companies</td><td></td><td></td></tr>
<tr><td>Others (Specify)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>12)</td><td>What strengths and opportunities do you see in the processing sector?</td><td colspan="2"></td></tr>
<tr><td>13)</td><td>What challenges do you face in the processing cycle? (from the raw material supply to the market). Are there any trends or threats that could affect the sector development?</td><td></td><td></td></tr>
<tr><td>14)</td><td>What challenges do you face in accessing markets for your produce?</td><td></td><td></td></tr>
<tr><td>15)</td><td>Where do you get the necessary market information? What channels do you use, or would you like to use? Is there any specific information that you would consider useful to have?</td><td></td><td></td></tr>
<tr><td>16)</td><td>If you imagine possible solutions to existing challenges in processing, do you think youth could play a role in overcoming those challenges? Could the latter offer them a new agribusiness opportunity?</td><td></td><td></td></tr>
</table>

17)	Are there opportunities in the processing business that could particularly favour young women?		
18)	What is the % of youth among your buyers		
19)	What strategies would you propose to increase youth engagement among your buyers?		
Sub–section C3 – Retailers and Wholesalers specific questions			
1)	Which of these crops do you deal in the most? Why (why did you choose this certain business)?	1 = Avocado 2 = Mango 3 = Fish 4 = Poultry 5 = Dairy 6 = Other (specify) _____	
2)	Where do you buy your produce from?	**Source** / **Volume** / **Price** Farm gate Brokers Other retailers Other wholesalers Farmer groups Others, Specify	
3)	Do you have any contract with your suppliers?		
4)	What is the average volume of the raw material you purchase monthly? Does your demand vary throughout the year (high season/low season)?		
5)	Do you have specific quality/size standards for your raw material?		
6)	Are you satisfied with the quality/amount of the raw materials? If not, how could the quality or quantity?		
7)	What are the main costs associated with your operation?		

<table>
<tr><td>8)</td><td>Who buys your products and the prices?</td><td colspan="2"><table>
<tr><th>Main buyers of products</th><th>Volume</th><th>Price</th></tr>
<tr><td>Brokers/Middlemen</td><td></td><td></td></tr>
<tr><td>Wholesalers and retailers</td><td></td><td></td></tr>
<tr><td>Other processors</td><td></td><td></td></tr>
<tr><td>Consumers directly</td><td></td><td></td></tr>
<tr><td>Others (Specify)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>9)</td><td>What challenges do you face in your business?</td><td colspan="2"></td></tr>
<tr><td>10)</td><td>Are there any trends or threats that could affect the sector development?</td><td colspan="2"></td></tr>
<tr><td colspan="4">Sub–section C3 – Retailers and Wholesalers specific questions</td></tr>
<tr><td>11)</td><td>What strengths and opportunities do you see in the retail and wholesale sector?</td><td colspan="2"></td></tr>
<tr><td>12)</td><td>What challenges do you face in accessing markets for your produce?</td><td colspan="2"></td></tr>
<tr><td>13)</td><td>Where do you get the necessary market information?</td><td colspan="2"></td></tr>
<tr><td>14)</td><td>What channels do you use, or would you like to use?</td><td colspan="2"></td></tr>
<tr><td>15)</td><td>Is there any specific information that you would consider useful to have?</td><td colspan="2"></td></tr>
<tr><td>16)</td><td>If you imagine possible solutions to existing challenges in retail and wholesale, do you think youth could play a role in overcoming those challenges? Could the latter offer them a new agribusiness opportunity for them?</td><td colspan="2"></td></tr>
<tr><td>17)</td><td>Are there opportunities in retail and wholesale that could particularly favour young women?</td><td colspan="2"></td></tr>
<tr><td>18)</td><td>What is the % of youth among your buyers</td><td colspan="2"></td></tr>
</table>

<table>
<tr><td>19)</td><td>What strategies would you propose to increase youth engagement among your buyers?</td><td></td><td></td></tr>
<tr><td colspan="4">Sub–section C4 – Input suppliers</td></tr>
<tr><td>1)</td><td>What are the main types of agro–inputs you deal in?</td><td>1 = Fertilisers
2 = Pesticides
3 = Seeds
4 = Equipment
5 = Animal feeds
6 = AI services
7 = Seedlings</td><td></td></tr>
<tr><td colspan="4">Sub–section C4 – Input suppliers</td></tr>
<tr><td></td><td></td><td>7 = Seedlings
8 = Chicks (Day old, month old)
9 = Fingerlings
7 = Others, specify</td><td></td></tr>
<tr><td>2)</td><td>Who are your main customers for these products</td><td>1 = Individual producers2 = Producer/Farmer groups
3 = Government agencies
4 = Others, specify</td><td></td></tr>
<tr><td>3)</td><td>What are the margins associated with each of these inputs</td><td colspan="2"><table><tr><th>Inputs</th><th>Estimated margins</th></tr><tr><td>Fertilisers/manure</td><td></td></tr><tr><td>Pesticides</td><td></td></tr><tr><td>Seeds/seedlings/cultivars</td><td></td></tr><tr><td>Equipment/machinery hire</td><td></td></tr><tr><td>Animal feeds</td><td></td></tr><tr><td>AI services</td><td></td></tr><tr><td>Others</td><td></td></tr></table></td></tr>
<tr><td>4)</td><td>What are some of key costs associated with running your business?</td><td></td><td></td></tr>
<tr><td>5)</td><td>Amongst your customers, what percentage are youth?</td><td></td><td></td></tr>
<tr><td>6)</td><td>Do you have any contracts with your customers?</td><td></td><td></td></tr>
<tr><td>7)</td><td>What are the main challenges in running your business?</td><td></td><td></td></tr>
</table>

8)	Are there any trends or threats that could affect the sector development?		
9)	What strengths and opportunities do you see in the input market?		
10)	What challenges do you face in accessing markets for your produce?		
11)	Where do you get the necessary market information?		
12)	What channels do you use, or would you like to use?		
13)	Is there any specific information that you would consider useful to have?		
Sub–section C4 – Input suppliers			
14)	What strategies can be put in place to address these challenges?		
15)	If you imagine possible solutions to existing challenges in input provision, do you think youth could play a role in overcoming those challenges? Could the latter offer them a new agribusiness opportunity for them?		
16)	Are there opportunities in input provision that could particularly favour young women?		
Section D: Additional questions on Youth / youth opportunities			
1)	What activities in your business involve youth as workers?		
2)	What activities in your business involve youth as partners or service providers?		
3)	Are there specific activities that are performed only by young men or young women? Which ones?		

5)	Do you have a special preference for hiring youth?	1 = Yes 2= No 3: I do not know	
6)	Did you find specific challenges in hiring youth?	1 = Yes 2= No 3: I do not know	
7)	If you answered YES to the previous question, please select the main challenges in hiring youth?	6. They are not interested 7. They are not available locally 8. They are too expensive 9. They do not have the right skills 10. Others: specify	
8)	Are challenges different between young women and young men?		
Section D: Additional questions on Youth / youth opportunities			
9)	How are the challenges different between young women and young men?		
10)	What challenges do you face in employing youth in your business?		
11)	What needs to be done to improve the employability of youth in your type of business?		
12)	What skills gap in youth need to be addressed to allow them engage in this business?		
13)	In your business do you offer training for youth upon employment? What type of training is offered? If not, why not?	1. Yes 2. No	
14)	What type of opportunities exist in your business for youths (both as wage workers and as entrepreneurs)?		

15)	What can be done to attract youths to in this business?		
16)	What skills gap in youth need to be addressed to allow them engage in this business?		
17)	What are challenges for youth in the employment activities in your business? How do they differ for young men and young women?		
18)	Explain the root causes of those challenges/ limitations? How would you suggest to address them?		
19)	Which strategy do you propose to upgrade youth engagement in your business? (economic, social and environmental)		
Section D: Additional questions on Youth / youth opportunities			
20)	Do you think there is there sufficient "space" for newcomers (= youth) in your VC segment (aggregation, processing, etc)?	1 = Yes 2 = No, why	
21)	Would you be willing to mentor youth that want to engage in your field (aggregation/ processing/ etc)?	1 = Yes 2 = No, why	
22)	What are the services that you need and for which you stand ready to pay a price? List them		
23)	Do you think that the provision any of the above services could represent an entrepreneurship opportunity for some youth?	1 = Yes, explain which ones 2 = No, why	

24)	On the same line of thinking, are there untapped resources that could be used by the youth to create a new business? Which ones? Is there any other use for instance of your product (ex. milk) that could be better harnessed? (ex. by processing it). Do you think there would be a demand for that product?	1 = Yes, explain which ones 2 = No, why	
Section E: **Occupational Safety and Health (OSH)**			
1)	What are the main OSH hazards that workers are exposed to in this business?	List the most common ones	
2)	Was there any OSH accident on the farm this year?	1 = Yes, please describe 2 = No	
3)	Do you adopt any OSH measures on the business to prevent hazards?	3. Yes, please provide examples No	
4)	For instance, in the Covid-19 situation, what did you do to inform and protect workers?		
Section E: **Occupational Safety and Health (OSH)**			
5)	Are there any measures that you are planning to implement but were not yet able to?	1 = Yes 2 = No	
6)	If Yes to the above indicate why	1 = Costs, not able to afford 2 = Lack of local providers or protective equipment (ex. masks) 3 = Lack of training or support centres 4 = Lack of time 5 = Others : Please explain	
Section F: Access to finance			
1)	What are the names of the formal financial institutions available in your county that serve businesses like yours?		

2)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	
3)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	
4)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Costs being too high 6 = Others : Please explain	
5)	What type of products or services would you wish to see provided by these institutions?		
Section F: Access to finance			
6)	What are the names of the informal financial institutions available in your county that serve businesses like yours?		
7)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	

8)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	
9)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Costs being too high 6 = Others : Please explain	
10)	What type of products or services would you wish to see provided by these institutions?		
11)	What digital finance providers are you aware of in your county?		
12)	What type of products do these institutions provide?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	
Section F: Access to finance			
13)	What type of products have you accessed from these institutions?	1 = Savings 2 = Loans and credit 3 = Insurance 4 = Investments 5 = Training 6 = Others : Please explain	

14)	What challenges do you face in accessing products and services from these institutions?	1 = Lack of awareness 2 = Location being too far 3 = Lack of collateral 4 = Perceived risk of use 5 = Costs being too high 6 = Others : Please explain	
15)	What type of products or services would you wish to see provided by these institutions?		
Section G: Access to training and business development services (BDS)			
1)	Have you been trained in any of the following?	1 =Use of certified seeds; 2 =Good crop management practices 3 =Good livestock management practices 4 =Keeping of farm records 5 =Post-harvest management 6 =Marketing and price setting 7 =Business plan writing 8 =Investor preparedness 9 =Book keeping 10 =Inventory management 11 =Financial management 12 = Others, specify	
2)	Who provided the training?		
Section G: Access to training and business development services (BDS)			

3)	What kind of training would you still need more urgently?	1 =Use of certified seeds; 2 =Good crop management practices 3 =Good livestock management practices 4 =Keeping of farm records 5 =Post-harvest management 6 =Marketing and price setting 7 =Business plan writing 8 =Investor preparedness 9 =Book keeping 10 =Inventory management 11 =Financial management 12 = Others, specify	
4)	What challenges do you face in accessing these trainings?	1 = Lack of awareness 2 = Costs, not able to afford 3 = Lack of local providers 4 = Limited knowledge 5 = Lack of time 6 = Others : Please explain	
5)	What kind of training products and services would you wish to be available in your county		
6)	Have you received any of the following BDS services?	1 = Business mentorship 2 = Coaching 3 = **Incubation** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 4 = **Acceleration support** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 5 = Market linkage support 6= Training 7= financial linkage 8= market development 9= Others : Please explain	
Section G: Access to training and business development services (BDS)			

7)	Who provided the BDS?		
8)	What challenges do you face in accessing these BDS services?		
9)	What kind of BDS services would you still need more urgently?	1 = Business mentorship 2 = Coaching 3 = **Incubation** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 4 = **Acceleration support** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 5 = Market linkage support 6= Training 7= financial linkage 8= market development 9= Others : Please explain	
10)	What challenges do you face in accessing these BDS services?	1 = Lack of awareness 2 = Costs, not able to afford 3 = Lack of local providers 4 = Limited knowledge on the use of BDS 5 = Lack of time 6 = Others : Please explain	

3) Youth Specific Interview Questionnaire

My name is _____ and I am working as an Enumerator for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing The Integrated County Approach (ICA) Project to boost decent jobs for youth in the agrifood systems in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in this survey because you are a young person engaged in the _____ value chain in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from farming activities. The survey will take about 50 minutes. Can we proceed with the interview? Do you have any questions?

Section A: Socio–demographic characteristics

S/ No	Question	Responses	Response code
1)	County		
2)	Sub county		
3)	Ward		
4)	Name of youth		
5)	Sex of respondent	1 = Male 2 = Female	
6)	Age bracket	1 = Less than 18 2 = 18–25 3 = 26–30 4 = 30–35	
7)	Highest level of education	1 = None/did not attend school 2 = Lower primary (1–4) 3 = Upper primary (5–8) 4 = Secondary school 5 = Post-secondary/TVET 5 = College/University 6 = Post graduate qualification	
9)	What is the value chain that you are engaged in?	1 = Avocado 2 = Mango 3 = Fish 4 = Poultry 5 = Dairy 6 = Other (specify) _____	
10)	What level of the value chain are you involved in?	1 = Producer 2 = Aggregator 3 = Processor 4 = Distributor 5 = Broker 6 = Trader –Retail 7 = Trader – Wholesale 8 = Consumer 9 = Other (specify) _____	
Section A: Socio–demographic characteristics			

11)	What is your type of engagement in the VC?	1 = Agripreneur 2 = Permanent employee/wage worker 3 = Seasonal / Part-timeemployee / wage worker 4 = Casual worker 5 = Contributing family worker 6 = Other (specify) _____	
12)	How many months in a year are you engaged?	_____	
13)	What is your average weekly income from these engagements? (KShs)	1 = 0 – 1 000 2 = 1 001 – 2 000 3 = 2 001 – 3 000 4 = 3 001 – 4 000 5 = 4 001 – 5 000 6 = 5 000 – 10 000 7 = Over 10 000	
14)	In your opinion, do you consider this pay adequate? Why?	1 = Yes 2 = No _____	
15)	What other benefits do you earn from your current employment?	1 = Social security 2 = Paid leave 3 = Housing 4 = Insurance 5 = Transport 6= Medical insurance 7= freedom to join a trade/workers union 8 = Others (specify) _____	
16)	In your opinion, are the working hours and working conditions appropriate?		
17)	What are some of the key challenges youth face in this type of employment? Are these challenges the same for young men and young women?		
Section A: Socio–demographic characteristics			

<table>
<tr><td>18)</td><td>What are some of the main challenges in your career progression? What steps have you taken to overcome these challenges?</td><td></td><td></td></tr>
<tr><td colspan="4">Section B: Registration and human resources</td></tr>
<tr><td>19</td><td>Is your business registered/formal? If not why?</td><td>4. Yes
5. No (explain why) _____
_____
6. I am in the process of obtaining the registration</td><td></td></tr>
<tr><td>20</td><td>How many workers do you employ?
How many of these are in full-time permanent workers?
How many are seasonal or casual?
What is the age group of these workers?</td><td>
<table>
<tr><th>Staff</th><th>Men</th><th>Wom-en</th><th colspan="3">Age</th></tr>
<tr><td></td><td></td><td></td><td>16–17</td><td>18–35</td><td>Above 35</td></tr>
<tr><td>Full time / per-ma-nent</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Sea-sonal or Casual</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td><td></td></tr>
<tr><td>21</td><td>Do you prefer to employ youth rather than adults? Why?</td><td>1. Yes
2. No
_____</td><td></td></tr>
<tr><td>22</td><td>Do you have contributing family workers supporting you? How many? And how many below 35?</td><td>1: Yes How many in total? _____
How many below 35)_____
2: No</td><td></td></tr>
<tr><td>23</td><td>In which tasks are these contributing family workers usually engaged? Any difference between young women and men?</td><td></td><td></td></tr>
</table>

Section B: Registration and human resources			
24	Are there youth below 18 among your family workers or among your hired workers?	6. Yes, in both groups 7. Yes, only among family workers 8. Yes, only among hired workers 9. No 10. I do not know	
25	Do youth below 18 do the same tasks as the other workers? Which tasks in particular?	1. Yes Which tasks? _____ _____ _____ 2. No	
26	Do the permanent/ full-time employees have written contracts?	1 = Yes 2 = No	
27	Do the employees on seasonal/casual have written contracts?	1 = Yes 2 = No	
28	How do you recruit these staff?	1 = Through referrals 2 = Recruiting from training institutions 3 = Adverts in local media 4 = Others (specify) _____	
29	Are there activities on the farm where only (or mainly) young women are engaged in? Are there activities where only/mainly young men are engaged?	1 = Yes 2 = No Mainly young women | Mainly young men	

30	Do you recruit migrant workers? For which tasks? Do their family members usually come with them and work on the farm?	3. Yes Specify tasks _____ _____ 4. No	
Section B: Registration and human resources			
31	Do you have any specific plan to employ more youth workers? If yes, for what kind of jobs/ tasks, in particular? What are the soft and technical skills needed for those jobs?	1. Yes Specify tasks _____ _____ Skills needed _____ _____ 2. No	
32	What is the average remuneration for staff in your business? (please distinguish permanent staff from seasonal/casual)	Permanent Staff K Sh_____ Seasonal staff K Sh _____	
33	What other benefits do you provide to your staff?	1 = Social security 2 = Paid leave 3 =Housing 4 = Insurance 5 = Transport 6= Medical insurance 7= Freedom to join a trade/workers union 8=Others(specify)_____	

<table>
<tr><td>34</td><td>What is the education level for the majority of the fulltime staff?

What is the education level for the majority of the casual staff?</td><td><table>
<tr><th>Education Level</th><th>Perma-nent</th><th>Casual</th></tr>
<tr><td>1 = None/did not attend school</td><td></td><td></td></tr>
<tr><td>2 = Lower primary (Std.1–4)</td><td></td><td></td></tr>
<tr><td>3 = Upper primary (Std.5–8)</td><td></td><td></td></tr>
<tr><td>4 = Secondary school</td><td></td><td></td></tr>
<tr><td>5 = Post-secondary/ TVET</td><td></td><td></td></tr>
<tr><td>5 = College/University</td><td></td><td></td></tr>
</table></td><td></td></tr>
<tr><td colspan="4">Section C: Occupational safety and health (OSH)</td></tr>
<tr><td>35</td><td>What are the main OSH hazards in this business?</td><td>1. Biological
2. Physical
3. Chemical
4. Ergonomic
5. Safety
6. Psychosocial
7. Other (specify)
_____</td><td></td></tr>
<tr><td>36</td><td>Was there any OSH accident on the farm this year?</td><td>1 = Yes Please describe
_____
2 = No</td><td></td></tr>
<tr><td>37</td><td>Do you adopt any OSH measures on the farm to prevent hazards?</td><td>4. Yes Please provide examples
_____
5. No</td><td></td></tr>
<tr><td>38</td><td>For instance, in the Covid-19 situation, what did you do to inform and protect workers?</td><td></td><td></td></tr>
</table>

39	Are there any measures that you are planning to implement but were not yet able to?	1 = Yes Please describe _____ 2 = No	
40	If Yes to the above indicate why	1 = Costs, not able to afford 2 = Lack of local providers or protective equipment (ex. masks) 3 = Lack of training or support centres 4 = Lack of time 5 = Others : Please explain	
Section D: Inputs and services			
41	Which inputs you need in your business?		
42	Do you have problems in accessing quality and affordable inputs? Which problems? (Quality, cost, etc.)	1. Yes 2. No If yes, describe the problems	
43	What has been the investment needed for starting your business?		
44	Does your agribusiness require large amounts of physical assets (e.g. a large plot of land or premises, expensive machinery, etc.)?	1. Yes Please explain _____ _____ 2. No	

45	How did you finance starting your business	1 = Savings 2 = Loans 3 = Family 4 = Investors 5 = Friends contribution 6 = Others, specify	
46	Would you say access to finance a problem for a young Agripreneur? Explain	1 = Yes 2 = No	
47	Have you ever asked for a credit from a formal financial institution?	1 = Yes 2 = No	
48	If yes above, did you get it? If not, why?	1 = Yes 2 = No Please explain_____	
Section D: Inputs and services			
49	What are existing financial products that are suitable for a young agripreneurs?	1 = Savings 2 = Loans 3 = Investments 4 = Others, specify	
50	Who offers these financial products?		

51	Which other non-financial services are available for young agripreneurs like you?	1 = Business mentorship 2 = Coaching 3 = **Incubation** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 4 = **Acceleration support** (Market access, market development, market research, market intelligence, product development, proof of concept etc.) 5 = Market linkage support 6= Training 7= financial linkage 8= market development 9= Others : Please explain	
52	Have you benefited from these business development services? If yes which ones? If No, Why?	1 = Yes Which ones? _____ _____ 2 = No Why Not? _____ _____	
53	**Other services**: What others services do you receive? Who provides them? Do youth provide any of these services? Do you think they could?	1. Extension services 2. Technical support 3. Vaccination 4. Others (specific) Who provides them?	
54	Are there services that you need but that are difficult for you to access? Who provides them what are the difficulty in getting them	Services Services Providers Difficulty (cost, quality, availability etc.)	
Section E: Business performance and opportunities for expansion			

55	For the last years (ex. 5), has the agribusiness grown, generating profits?	1. Yes, it has grown 2. No, it has been stable 3. No, we faced losses 4. I do not know	
56	Can you expect that the market demand will continue to increase?	1. Yes 2. No	
57	If no, what factors might impede the growth of the market demand?		
58	Who are the main competitors in your area?		
59	Why do clients prefer your product compared to others?		
60	Do you think there is sufficient "space" for newcomers (= youth) to this business?	1 = Yes 2 = No	
61	Would you be willing to mentor other youth that want to engage in this businesss?	1 = Yes 2 = No	
62	What are the main challenges you face in your business? How do you deal with the challenges you face?	Challenges Solutions	
63	Could a solution to the existing challenges represent an entrepreneurship opportunity for other youth or for self to expand? Can you describe it?	1 = Yes 2 = No If yes, which opportunity?	

64	On the same line of thinking, are there un-tapped resources that could be used by the youth to create a new business? Which ones?	1 = Yes 2 = No If yes, which one?	
65	Is there any other use for instance of your product (e.g. milk) that could be better harnessed? (E.g. by processing it).	1 = Yes 2 = No If yes, which use?	
66	For the above, do you think there would be a demand for that product?	1 = Yes 2 = No	
67	What could the public and private sectors do in order to support youth employment creation? Can you mention a specific initiative/action that you are contributing to in this regard?		
Section F: Social and environmental sustainability of the business			
68	Is your business making any **contribution to the community** or is it expected to do so soon? How?	1. Yes (explain) 2. No	
69	Which actions or processes have you introduced to make it more socially sustainable?		

70	Do you think that there is need to improve working conditions in your business?	1. Yes (explain how) 2. No (Explain why not)	
71	Have you initiated any actions to address eventual problems? Which ones?	1= Yes (Explain) 2 = No	
72	Do you consider your business a green one? (Using sustainable materials) Explain which actions or processes have you introduced to make it more **environmentally sustainable**?	1. Yes (explain) 2. No	
73	Has it been economically profitable for you to do this?	1 = Yes 2 = No	

4) Focus Group Discussion (FGD) Interview Guide (Youth)

My name is _____ and I am working as an Enumerator for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing The Integrated County Approach (ICA) Project to boost decent jobs for youth in the agrifood systems in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in the survey because you are youth engaged in agrifood value chains in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from farming activities. The interview will take about 2 hours. Can we proceed with the interview? Do you have any questions?

Name of group:…….. **County**:……..……..

Sub – County: ……...…… **Number of participants.....…… (male…… female**……)

A. Participation of youth in the VC

1) **In which nodes of the value chain are youth mostly engaged currently?**

Core value chain: ☐ Production ☐ Aggregation ☐ Processors ☐ Distribution

Extended value chain (support services) ☐ Transport ☐ Trade ☐ Input services

☐ Financial services ☐ Others_____

2) **Indicate the order in which they mostly participate in the VC?**

☐ Producers/owners ☐ Wage workers ☐ Contributing family workers

3) **What difference is in participation between young women and young men**

4) **As wage workers, what kind of employment opportunities do youth typically obtain in this VC?**

Type of engagement ☐ Formal ☐ Informal

Type of contracts ☐ Permanent ☐ Seasonal (casual)

5) **Do youth below 18 engage in the value chain?** ☐ Yes ☐ No

6) **From what age do youth below 18 participate in this value chains**

☐ Young women _____ ☐ Young men_____

7) **Which activities do youth below 18 they participate in?**

Young Women	Young Men
_____	_____
_____	_____
_____	_____

8) **Is easy for youth to find a job in this value chain?** ☐ Yes ☐ No

9) **Are there many opportunities for work in this value chain?** ☐ Yes ☐ No

If yes, what are they?_____
_____

10) **Are these opportunities expanding?** ☐ Yes ☐ No

11) **Do the youth have the right skills to match the opportunities available?** ☐ Yes ☐ No

12) **What is their general education level?** _____

13) **How many of you have received agicultural technical trainings?** _____

14) Are you aware of any **success story** of a young women or men below 35 that is successfully engaged in the value chain and earns a living income out of it?

☐ Yes ☐ No

15) **How were the youth in the success story engaged in the value chain?**

Young woman_____
_____

Young Man_____
_____

16) **Do you consider that working in this value chain is overall profitable for young people**? ☐ Yes ☐ No

17) **Do you think youth are earning adequate for a living income?**

As entrepreneurs ☐ Yes ☐ No As wage workers ☐ Yes ☐ No

18) **If you could choose**, would you still be working in this VC in the next 5–10 years?

☐ Yes ☐ No

Why? _____

19) **Beyond this value chain, which other agricultural VCs offer good opportunities to youth in your County?**_____

20) **In your opinion, what needs to be done to boost youth profitable engagement in this or other VCs?** _____

_____

B. Youth in the *production node* of the value chain

21) **In production, are youth currently engaged profitably/productively?**

22) **What is the average age of producers?**

Young women_____ Young men_____

23) **Are profits/wages good for youth working in the production node**

Young women_____ Young men_____

24) **How would you gauge the quality of the following work conditions for youth?**

Quality of work conditions	Good	Fair	Poor
Salaries/wages			
Working conditions			
Workload			
Reliability of work opportunities			
Workplace hazards			
Treatment of employees			
Other.....			

25) **What challenges do youth face as producers in the value chain?**

_____

_____

26) **Are these challenges similar for young men and young women?** ☐ Yes ☐ No

27) **What are the causes of these challenges?** _____

_____

_____

28) **What could be done to address these challenges and make youth jobs more productive / more decent?**

_____

_____

29) **Are there any challenges that the producers have in this value chain, which may lead to a youth–led solution/business opportunity?** ☐ Yes ☐ No

If yes, which ones? _____

_____

30) **What is the average size of land used for production in this value chain**?_____

31) **Is it easy for youth to access land for production in the value chain**?_____

32) **Are you aware of any programme or initiative promoting youth access to land?**

☐ Yes ☐ No

If yes, which ones? _____

_____

33) **What inputs do you use for agricultural production?** (E.g. Certified Seeds, fertilizers and pesticides etc.)

_____

34) **Do you face any challenges in accessing these inputs?** ☐ Yes ☐ No

Which ones? _____

_____

35) **Is there a problem in general to access quality inputs?** ☐ Yes ☐ No

36) **In your opinion, what needs to be done to address these challenges?**

_____

_____

37) **What role would youth have in addressing these challenges?**

_____

_____

38) **Could solving this challenge represent a business opportunity for youth?** ☐ Yes ☐ No

Kindly explain_____

_____

39) **How can youth provide these services?**

_____

_____

<u>Youth and Post-harvest activities</u>

40) **What post-harvest management methods are used in this value chain?**

_____

_____

41) **What roles do youth play in these post-harvest activities?**

_____

_____

42) **Do you experience any post-harvest losses?** ☐ Yes ☐ No

43) **What are the main causes of post-harvest losses?**

_____

_____

44) **How do you propose to address post-harvest losses?**

_____

_____

45) **How could youth be involved in addressing this issue?**

_____

_____

46) **Which strategies would you propose to promote youth engagement in the post-harvest activities?**

_____

_____

47) **Could solving this challenge represent a business opportunity for youth?** ☐ Yes ☐ No
Kindly explain _____ _____

_____

<u>Youth in aggregation activities</u>

48) **Who is responsible for aggregation in the value chain?**

_____

_____

49) **Do youth own aggregation businesses?** ☐ Yes ☐ No

50) **Do youth work for aggregators?** ☐ Yes ☐ No

51) How would you gauge the quality of the following conditions for youth in aggregation jobs?

Quality of work conditions	Good	Fair	Poor
Salaries/wages			
Working conditions			
Workload			
Reliability of work opportunities			
Workplace hazards			
Treatment of employees			
Other.....			

52) **Are these challenges similar for youth men and young women?** ☐ Yes ☐ No

53) **What are the causes of these challenges?**

_____

_____

54) **What could be done to address these challenges and make youth jobs more productive /more decent?**

_____

_____

55) **Are there any challenges that the aggregators have in this value chain, which may lead to a youth–led solution/business opportunity?** ☐ Yes ☐ No

If yes, which ones? _____

_____

Youth in processing activities

56) **What are the primary/secondary processing activities undertaken in the value chain?**

_____

_____

57) **What roles do youth play in these processing activities?**

58) **Do youth own processing businesses?** ☐ Yes ☐ No

59) **Do youth work for processors?** ☐ Yes ☐ No

60) **How would you gauge the quality of the following conditions for youth in processing jobs?**

Quality of work conditions	Good	Fair	Poor
Salaries/wages			
Working conditions			
Workload			
Reliability of work opportunities			
Workplace hazards			
Treatment of employees			
Other.....			

61) **Are these challenges similar for youth men and young women?** ☐ Yes ☐ No

62) **What are the causes of these challenges?**

_____

_____

63) **What could be done to reduce those deficits and make youth jobs more productive / more decent?**

_____

_____

64) **Are there any challenges that the processors have in this value chain, which may lead to a youth–led solution/business opportunity?** Yes No

If yes, which ones? _____

_____

65) **Are there untapped processing opportunities (e.g. a by–product of the produce) that are currently not exploited and which would represent a good business opportunity for youth?** Yes No

If yes, which ones? _____

_____

<u>Marketing and retail activities</u>

66) **To whom is the agricultural produce sold?** _____

67) **What is the average distance to the market?** _____Kms

68) **What is the average cost of transportation?** K Sh_____per_____

69) **What mode of transport is mainly used?** _____

70) **Where do you get your information about the market?**

(Speaking to others, whatsapp groups, social media, etc.)? _____

71) **What channels do you use to obtain information?** _____

72) **What channels would you like to use in the future?** _____

73) **Is there specific market information that you might like to have?** _____

74) **Why would you like to have this information**_____

75) **What roles do you play in marketing and retail of this VC produce?**

_____

76) **What challenges are there when marketing this VC produce?**

_____

77) **In your opinion, what can be done to address these challenges?**

_____

78) **What role can youth play in the marketing process?**

_____

<u>Access to financial services</u>

79) **What are the names of the formal, informal financial institutions and digital financial services available in your county?**

_____

_____

80) **What type of financial and non-financial products do these institutions provide?**

_____

_____

81) **Do they have a specific product for youth?** ☐ **Yes** ☐ **No**

If yes, which ones? _____

82) **Have you ever accessed any of these financial services** ☐ Yes ☐ No

83) **If yes, which ones have you ever accessed?**

_____

84) **What challenges do you face, as young people, in accessing products and services from financial institutions?**

_____

85) **How are youth overcoming these challenges?**

_____

86) **In your opinion what can be done to address challenges of access to finance for youth?**

_____

87) **What type of products or services would you wish to see provided by these institutions?**

_____

Access to training and business development services (BDS)

88) **What kind of BDS is available to actors in your value chain?** ***(Tick as appropriate)***

1) Training	2) Coaching And Mentorship,	3) Market Access Advice
4) Market Research	5) Market Development	6) Financial Linkages
7) Legal And Contracting	8) Business Records	9) Business Planning
10) OTHERS		

89) **Are they easy to access for the youth?** Yes No

90) **What challenges do youth face in accessing these BDS services**

_____

91) **Are any of these services youth–targeted?** ☐ Yes ☐ No

If yes, which ones?_____

92) **What kind of BDS have you received?** _____

93) **Who provided the BDS?** _____

94) **What challenges do you face in accessing these BDS services?** _____

95) **In your opinion what can be done to address challenges of access to BDS for youth?**

_____

96) **What kind of BDS products and services would you wish to be available in your county?**

_____

Occupational safety and health (OSH) and decent work

97) **Do you usually have access to information and preventive/protective measures to guarantee your safety and health while you are at work?** ☐ Yes ☐ No

If yes, which ones (e.g. training, protective equipment, COVID-19 protection) etc?

_____

98) **Who provides you with this information and protective equipment?**

_____

99) **Can you provide some examples of occupational risks that you face in your value chain?**

_____

100) **What are the measures that you currently adopt to protect yourself?**

_____

101) **Did you have any accident recently while doing your job?** ☐ Yes ☐ No

If yes, what happened? _____

Youth representation in the value chain governance

102) **Are there any farmer cooperatives, societies or associations in this county?** Yes No

103) **What roles do youth play in those?** _____

104) **Have you ever had any training or meeting to tell youth about them?** ☐ Yes ☐ No

105) **Have you ever had a leadership training from them?** ☐ Yes ☐ No

If yes, which one? _____

106) **To what extent are youth represented in these associations**? _____

107) **Do youth face any challenges in being members of these cooperatives and associations?** ☐ Yes ☐ No

If yes, what challenges? _____

108) **Do youth get into managerial positions?** ☐ Yes ☐ No

109) **Are you aware of the governance mechanisms of this value chain?** ☐ Yes ☐ No

110) **Are youth represented in governance of this value chain?** ☐ Yes ☐ No

111) **Are there any youth organization or networks that represent the youth interests in this value chain?** ☐ Yes ☐ No

If yes, which ones?_____

112) **How would you like to see youth represented in the governance of this value cha in?**_____

5) Financial Institution Interview

Checklist

My name is _____and I am working as an Enumerator for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing The Integrated County Approach (ICA) Project to boost decent jobs for youth in the agrifood systems in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in the survey because you are knowledgeable on agrifood value chains in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from farming activities. The survey will take about 1 hour. Can we proceed with the interview? Do you have any questions?

A. Background Information

1) County: _____

2) Location: _____

3) Type of Financial Institution

   a) Commercial Banks (please specify _____

   b) Micro Finance Institutions (MFIs) (please specify) _____

   c) Fintech/Digital Financial Services Providers _____

   d) Cooperative Societies (please specify) _____

   e) Affirmative Funds such as YEDF, WEF

   f) Village Societies such as Chamas, Roscas etc. (please specify) _____

   g) Others (Specify)_____

B. Product/ services offered

1) What are the types of product/ services do you offer to the youth involved in agriculture?

   a) Saving (Specify) _____

   b) Credit/ Loan(Specify) _____

   c) Insurance (Specify) _____

   d) Investment (Specify) _____

   e) Training (Specify) _____

   f) Business development services (Specify) _____

   h) Financial/Digital Fiancial services _____

   g) Others (Specify)_____

2) In the listed services below, please indicate the nature of youth specific products – product feature is and level of uptake for these products

S/No.	Youth specific product/service	Product features	Level of uptake High – 3; Moderate – 2 Low – 1
1.	Savings		
2.	Loan/ Credit		
3.	Insurance		
4.	Investment		
4.	Training		
5.	Others (Specify)		

3) On average, what is the approximate amount in Kenya shillings you have advanced to youth involved in agriculture, mode of advancing (individual or group), and type of collateral required to the youths in the value chain?

S/No.	Amount (KShs)	Mode of advancing (Individual, group lending, digital platforms etc.)	Type of collateral
1.	Less than 50 000		
2.	51 000 – 100 000		
3.	100 001 – 150 000		
4.	151 000 – 200 000		
5.	200 001– 250 000		
6.	More than 250 000		

4) Do you partner with any other institutions (Private service providers/NGOs/Government agencies) in offering products/ services to youth involved in agriculture?

a) Yes b) No

If Yes in the above question, specify the institution and the product/ service they offer.

S/No.	Name of Institution	Nature of products or services involved
1.		
2.		
3.		
4.		

5) What challenges do youth face in accessing products and services from your financial institution? Do young women face specific challenges?

a) _____

b) _____

c) _____

d) _____

e) _____

6) What challenges do you face as a financial institution in offering products/ services to youth involved in agriculture? Is any of these challenges specific for young women?

a) _____

b) _____

c) _____

d) _____

e) _____

7) In your opinion what can be done to address access to financial services especially for youth involved in agriculture?

a) _____

b) _____

c) _____

d) _____

e) _____

8) What are plans do you have in place to address the challenges on access to financial services that youth involved in agriculture face?

a) _____

b) _____

c) _____

d) _____

e) _____

Thank you!

6) Key Informant Interview – Checklist

My name is _____ and I am working as an Enumerator for The Food and Agriculture Organization (FAO) of the United Nations.

FAO is currently implementing The Integrated County Approach (ICA) Project to boost decent jobs for youth in the agrifood systems in Kakamega and Siaya Counties. In order to create youth employment opportunities, ICA–Kenya seeks to identify priority value chains that have the highest potential to provide employment and self-employmentopportunities in your county.

You have been selected to participate in the survey because you are knowledgeable on agrifood value chains in your county. Your participation is voluntary and any information given will be kept confidential. However, your views will help us to provide strategies for improving returns from farming activities. The survey will take about 2 hours. Can we proceed with the interview? Do you have any questions?

Youth engagement in agricultural value chains

1) **At what level are youth mainly engaged in these VCs**? (Production, Aggregation, Processors, Distribution, Transportation, Traders and Consumers)? What roles do they play at each of the levels?

2) **What kind of employment opportunities do youth usually obtain in these VCs?** (Formal/

informal; type of contracts; level of wages; access to social security and occupational safety and health measures)

3) **What challenges do youth face in engaging in activities in these VCs**? (Low wages, poor working conditions, heavy workload, unreliability of work opportunities etc.). Are these challenges similar for youth men and young women?

4) Do you consider that working in this value chain is **overall profitable for young people**?

5) Do you think youth are earning adequate for a living income as entrepreneurs? And as wage workers?**In your considered opinion, which agricultural value chains would be best suited** to address youth employment in your County? Why are these VCs most attractive?

6) **What current opportunities exist** in these value chains for youth to benefit from? Are there business opportunities in the sector that are more suitable to either young women or young men? If yes, which ones? What is the reason for that?

7) **What challenges do youth face in accessing these opportunities**? (ex. skills do not march, lack of awareness on the available opportunities, lack of credit for youth startups, etc.) Do young women and men face different challenges? Can you indicate why?

8) In your opinion, **what needs to be done to address these challenges**? What strategy can you propose to upgrade the role played by both young men and young women in the sector? Would you propose specific activities for youth women?

9) In your opinion, **what would be the cost of undertaking investments** to address these challenges?

Production and access to land and inputs

10) **In production, are youth currently engaged profitably/productively?** What is the average age of producers?

11) **Are profits/wages and working conditions good or do youth face some decent work deficits**? (Low wages, poor working conditions, heavy workload, unreliability of work opportunities, hazards, abuses, etc.). Are these challenges similar for youth men and young women? What are the causes of these challenges? What could be done to reduce those deficits and make youth jobs more productive / more decent?

12) Are there any challenges that the producers have in this value chain, which may lead to a **youth–led solution/business opportunity**? (ex. low quality honey due to poor quality hives – a business could be the production of more performant hives).

13) What **challenges do young women and men face in accessing land** for agricultural production? What are the causes of these challenges? Are they the same for young men and women?

14) In your opinion, what needs to be done to address these challenges? How could youth be supported to overcome these obstacles?

15) **Do producers face challenges in accessing inputs for agricultural production?** (E.g. Seeds, fertilizers and pesticides etc.) What are some of the challenges faced in accessing these inputs?

16) In your opinion, what needs to be done to address these challenges?

17) What would be the role of youth in addressing these challenges?

Post-harvest activities

18) What post-harvest management methods are used in the identified value chains?

19) What roles do youth play in these post-harvest activities?

20) Are there significant post-harvest losses in the VC? What are the main causes? How do you propose to address them?

21) How could youth be involved in addressing this issue? Could solving this challenge represent a business opportunity for youth?

Aggregation activities

22) Who is responsible for aggregation in the value chain? Do youth own aggregation businesses? Or do they work for aggregators?

23) **Are profits/wages and working conditions good or do youth face some decent work deficits**? (Low wages, poor working conditions, heavy workload, unreliability of work opportunities, hazards, abuses, etc.). Are these challenges similar for youth men and young women? What are the causes of these challenges? What could be done to reduce those deficits and make youth jobs more productive?

24) Are there any gaps in the aggregation node of the value chain where youth could provide a youth–led solution/business?

Processing activities

25) What are the primary/secondary processing activities undertaken in the value chain?

26) What roles do youth play in these processing activities? Do youth own processing businesses? Or do they work for processors?

27) **Are profits/wages and working conditions good or do youth face some decent work deficits**? (Low wages, poor working conditions, heavy workload, unreliability of work opportunities, hazards, abuses, etc.). Are these challenges similar for young men and young women? What are the causes of these challenges? What could be done to reduce those deficits and make youth jobs more productive?

28) Are there any gaps in the processing node of the value chain where youth could provide a youth–led solution/business?

29) Are there **untapped processing potentials**? Ex. a by–product of the produce that is currently not exploited and which would represent a good business opportunity for youth?

Marketing activities

30) To whom is the agricultural produce sold to? What is the average distance to the market? What are the average costs of transportation? What mode of transport is mainly used? What are the main marketing channels?

31) What roles do youth play in marketing of agricultural produce?

32) What challenges do farmers face in marketing agricultural produce?

33) In your opinion, what can be done to address these challenges? What role can youth play

in this process to help overcome issues? (Ex. Where do producers get information about the market (speaking to others, whatsapp groups, social media, etc)? Is there specific market information that is missing and digital marketing services be a service that youth could provide?

Access to financial services

34) What are the names of the formal, informal financial institutions and digital financial services available in your county?

35) What type of financial and non-financial products do these institutions provide? Are there any services that are tailored specifically to support youth agripreneurs?

36) What challenges do youth face in accessing products and services from these institutions?

37) In your opinion what can be done to address access to finance especially for youth?

38) What type of products or services would you wish to see provided by these institutions?

Access to training and BDS services

39) **What kind of BDS is available to actors in the value chain?** (Training, coaching and mentorship, market access advice, market research, market development, financial linkages support, legal and contracting, business records support, business planning etc.)

40) Are these services accessible for youth as well?

41) Who provided the BDS?

42) What kind of BDS products and services are missing in the county and should be established?

43) What challenges do youth face in accessing these BDS services?

44) In your opinion, what can be done to enhance youth access to BDS for agribusiness?

Occupational safety and health (OSH) and decent work

45) Are information and preventive/protective measures to guarantee workers' safety and health easily accessible in the VC? Which ones (ex. training, protective equipment)? Also to protect workers from COVID–19?

46) Who provides workers with this information and protective equipment?

47) Can you provide some examples of occupational risks in the VC? And what are the measures that are currently adopted to protect workers?

48) Are you aware of accidents recently happened for workers in the VC? What happened?

49) Are you aware of any workers' rights violations in the VC? (ex. discrimination, child or forced labour, violation of the right to organization, etc.)

Youth representation in the value chain governance

50) How many farmer cooperatives or associations exist in this county? What roles do these groups play? To what extent are youth represented in these groups?

51) Do youth face any challenges in being members of these cooperatives and associations? What challenges? Do they get into managerial positions also?

52) Are you aware of the governance mechanisms of this value chain? Are youth represented?

Is there any youth organization or network that represent the youth interests in this value chain?

Enabling Environment

53) What are the current initiatives (including development programs and policies) to improve or influence the performance of the value chains actors with focus to youth engagement and employment in the value chain

Current initiatives to improve VC performance	Youth engagement and employment

54) What are the sector's strengths, weaknesses, opportunities and threats in terms of youth participation in different VC segments and service provision

Strengths	Weaknesses	Opportunities	Threats

55) What is the **most promising activity in this VC**, which can employ a big number of young women and men, less skilled and skilled?

56) What specific actions should be supported at national level to boost youth participation in the VC (which are not yet in place)? Should any of these actions target young women in paticular? Why?

Appendix v: list of respondents interviewed

1. **Producers Interviews**

S/No	Name	Location	Gender
1.	Hellen Masakwe	Kakamega	Female
2.	Philis Mbati Mukova	Kakamega	Female
3.	Esther Juma	Kakamega	Female
4.	Shitote Zakaria	Kakamega	Male
5.	Sivestor Shitote	Kakamega	Male
6.	Evan I Shitote	Kakamega	Male
7.	Mary Omukala	Kakamega	Female
8.	Yusuf Alukwe	Kakamega	Male
9.	Yusuf Alukwe	Kakamega	Male
10.	Eveline Anguche	Kakamega	Female
11.	Gladys Mumanyi	Kakamega	Female
12.	Christopher Mutubi	Kakamega	Male
13.	Moses Wesonga	Kakamega	Male
14.	William Mola	Kakamega	Male
15.	Vincent Mukeyia	Kakamega	Male
16.	Orwa Andala	Kakamega	Male
17.	Abdalla Nganyi	Kakamega	Male
18.	Benjamin Wanguba	Kakamega	Male
19.	Immaculate Imboba	Kakamega	Male
20.	Justus Ikatukhu	Kakamega	Male
21.	Moses Olando	Kakamega	Female
22.	Nelson Swali	Kakamega	Male
23.	Mohammed Peywa	Kakamega	Male
24.	Salome Kakai	Kakamega	Female
25.	Patrice Achero	Kakamega	Male
26.	Lydia Wafula	Kakamega	Male
27.	Jackson Lusuli	Kakamega	Female
28.	Philip Were	Kakamega	Female
29.	Kombe Maulidi	Kakamega	Female
30.	Eunice Kalagi	Kakamega	Male
31.	Anne Vudiga	Kakamega	Male
32.	Simon Orata	Kakamega	Male
33.	Margreat Opuka	Kakamega	Male
34.	Mwajuma Ohefa	Kakamega	Male
35.	Reuben Anunda	Kakamega	Male
36.	Ailam Kawere	Kakamega	Male
37.	Patrick Makani	Kakamega	Female
38.	Iseac Okumu	Kakamega	Male
39.	Josphat Muhenda	Kakamega	Male
40.	Benson Ngome	Kakamega	Male

S/No	Name	Location	Gender
41.	Joseph Barasa	Kakamega	Male
42.	Robert Luseno	Kakamega	Male
43.	Christine Naliaka	Kakamega	Female
44.	Priscah Bulimo	Kakamega	Female
45.	Edward Wafula	Kakamega	Female
46.	David Wafula	Kakamega	Female
47.	Alice Mwenje	Kakamega	Male
48.	Loice Jahenda	Kakamega	Male
49.	Samwel Indangasi	Kakamega	Male
50.	Eunice Mmbanje	Kakamega	Female
51.	Lilian Mwanga	Kakamega	Male
52.	Fransisca Isambo	Kakamega	Male
53.	Valentine Andalia	Kakamega	Female
54.	James Juma	Kakamega	Male
55.	Kelvin Kamusinde	Kakamega	Male
56.	Lilian Akoth	Kakamega	Male
57.	Job Wamunga	Kakamega	Male
58.	Emily Nandwa	Kakamega	Female
59.	Careen Mukhwana	Kakamega	Male
60.	Amos Waloba Sakwa	Kakamega	Male
61.	Henry Ongina	Kakamega	Male
62.	Jailet Makungu	Kakamega	Female
63.	Lydia Atieno	Kakamega	Female
64.	Matukho John	Kakamega	Male
65.	Isaac Mudavadi	Kakamega	Female
66.	Leah Atemi	Kakamega	Female
67.	John Ashitiva	Kakamega	Male
68.	Samuel Akollo	Kakamega	Male
69.	Rose Okello	Kakamega	Male
70.	Simeon Andalo	Kakamega	Male
71.	Rashid Obat	Siaya	Male
72.	Antony Nyamulo	Siaya	Male
73.	Alfred Odhiambo	Siaya	Male
74.	Careen. Awino	Siaya	Male
75.	Maurice Were Otieno	Siaya	Female
76.	Schola William Manyala	Siaya	Female
77.	Jenipher Japien Omollo.	Siaya	Male
78.	Pascalia Anyango	Siaya	Male
79.	Consolate Atieno	Siaya	Female
80.	Francis Ochieng	Siaya	Female
81.	Joshua Awino Owuor	Siaya	Female
82.	Jacktone Otieno Olal	Siaya	Female

S/No	Name	Location	Gender
83.	Samuel Odhiambo Sijei	Siaya	Male
84.	Charles Oyomba	Siaya	Female
85.	Teresa Ongayo	Siaya	Male
86.	Joyce Awino	Siaya	Female
87.	Osodo Boniface	Siaya	Male
88.	Abraham Mugah	Siaya	Female
89.	Luke Obiero	Siaya	Female
90.	Petrolina M Savonge	Siaya	Male
91.	Wilfrida Atieno	Siaya	Female
92.	Sylvia Odembo	Siaya	Male
93.	John Ouma	Siaya	Male
94.	Moses Okwatcho	Siaya	Female
95.	Michael Owino	Siaya	Male
96.	Mourice Odhiambo	Siaya	Female
97.	Millicent Adega	Siaya	Female
98.	Mourice Obodo	Siaya	Male
99.	Jectone Osewe	Siaya	Male
100.	John Otieno	Siaya	Female
101.	Esther Salome	Siaya	Female
102.	George Orondo	Siaya	Male
103.	Adori	Siaya	Male
104.	Caroline Atieno	Siaya	Male
105.	Agnes Awuor	Siaya	Male
106.	Ignatius Otieno	Siaya	Male
107.	Tom Migaya Omolo	Siaya	Male
108.	Charles Onyango	Siaya	Male
109.	Martin Ouma Onyango	Siaya	Male
110.	Peters Ochieng	Siaya	Male
111.	Chrispine Okolo	Siaya	Female
112.	Ibrahim Odawa	Siaya	Female
113.	Japur	Siaya	Male
114.	Michael Gondi	Siaya	Female
115.	Janyamonye	Siaya	Male
116.	Anjelina Anyango	Siaya	Female
117.	Susan Suji	Siaya	Male
118.	Vincent Otieno	Siaya	Female
119.	Benjamin Alaro.	Siaya	Male
120.	Alice Awuor Anyango	Siaya	Male
121.	Joram Obonyo	Siaya	Male
122.	Florence Atieno	Siaya	Male
123.	Charles Omoth	Siaya	Male
124.	Owen Akumu	Siaya	Male

S/No	Name	Location	Gender
125.	David Onyango	Siaya	Male
126.	Peter Ndeche	Siaya	Male
127.	Daniel Ochieng	Siaya	Male
128.	Charles Ngang	Siaya	Female
129.	Peter Kidera	Siaya	Male
130.	Lilian Owino	Siaya	Female
131.	Wickliffe Onyango	Siaya	Male
132.	Lawrence Barrack	Siaya	Male
133.	Lawrence Okoth	Siaya	Male

2. **Youth Specific Questionnaire**

S/No	Names	Location	Gender	Value Chain Level
1.	Steven Akala	Kakamega	Male	Producer
2.	Alfred Khayinga	Kakamega	Male	Producer
3.	Christopher Okova	Kakamega	Male	Producer
4.	Kevil Shisokoro	Kakamega	Male	Producer
5.	Edward Anjeche	Kakamega	Male	Producer
6.	Nashali Opaka	Kakamega	Male	Processor
7.	Philip Imbote	Kakamega	Male	Producer
8.	Simon Orata	Kakamega	Male	Producer
9.	Veronica Kanila	Kakamega	Female	Producer
10.	Clayton Mukeyia	Kakamega	Male	Producer
11.	Japheth Lute	Kakamega	Male	Producer
12.	Obed Mutaliani	Kakamega	Male	Processor
13.	Kennedy Nanzwa	Kakamega	Male	Aggregator
14.	Hesbon Andika	Kakamega	Male	Producer
15.	Leroy Shava	Kakamega	Male	Producer
16.	Stella Ashiali	Kakamega	Female	Processor
17.	Francisca Barasa	Kakamega	Female	Processor
18.	Amina Essendi	Kakamega	Female	Producer
19.	Nicolas Webukha	Kakamega	Female	Trader Retail
20.	Alphew Chivini	Kakamega	Male	Producer
21.	Brain Simwa	Kakamega	Male	Producer
22.	Wilfred Wanzetse	Kakamega	Male	Producer
23.	Khalid Asman	Kakamega	Male	Producer
24.	Brian Owade	Kakamega	Male	Producer
25.	Peter Shakwila	Kakamega	Male	Producer
26.	Nelson Ichami	Kakamega	Male	Producer
27.	Sebastian Mageni	Kakamega	Male	Producer
28.	Gabriel Asira	Kakamega	Male	Producer
29.	Edmont Omware	Kakamega	Female	Aggregator
30.	Sharon Chepsoyo	Kakamega	Male	Input Suppliers

S/No	Names	Location	Gender	Value Chain Level
31.	Eileen Kwatsima	Kakamega	Female	Input Suppliers
32.	Oscar Akubwa	Kakamega	Female	Trader Retail
33.	Friday Ayieko	Kakamega	Female	Trader Retail
34.	Zulpha Iminza	Kakamega	Male	Trader Wholesale
35.	John Osore	Kakamega	Male	Trader Wholesale
36.	Jenifer Wopa	Kakamega	Male	Processor
37.	Boaz Osanya	Kakamega	Male	Producer
38.	Ben Luta	Kakamega	Male	Input Suppliers
39.	Japheth Lukoye	Kakamega	Female	Trader Wholesale
40.	Bernard Sosi	Kakamega	Male	Trader Wholesale
41.	Ernest Alubokho	Kakamega	Female	Trader Wholesale
42.	Socrates Mangala	Kakamega	Male	Producer
43.	Ambrose Kubai	Kakamega	Male	Aggregator
44.	Chrisanthus Mukhanji	Kakamega	Male	Producer
45.	Carolyne Nyakoa	Kakamega	Male	Producer
46.	Leah Omenya	Kakamega	Female	Processor
47.	Washington Obwogo	Kakamega	Male	Producer
48.	Elvis Omenda	Kakamega	Female	Trader Retail
49.	Renny Wechuli	Kakamega	Female	Distributor
50.	Zulpha Iminza	Kakamega	Male	Trader Retail
51.	Rahma Ismael	Kakamega	Female	Trader Retail
52.	Stella Awinja	Kakamega	Male	Producer
53.	Glades Olumasai	Kakamega	Female	Trader Retail
54.	Ezekiel Shiundu	Kakamega	Female	Trader Retail
55.	Erick Anyangu	Kakamega	Male	Input Suppliers
56.	Lydia Wafula	Kakamega	Female	Trader Retail
57.	Brian Mapati	Kakamega	Male	Producer
58.	Noel Muchemo	Kakamega	Male	Producer
59.	Micheal Mwangela	Kakamega	Male	Input Suppliers
60.	Obed Mandela	Kakamega	Male	Input Suppliers
61.	Caroline Apondi	Siaya	Male	Trader Retail
62.	Joseph Okoth	Siaya	Male	Input Suppliers
63.	Collins's Otieno	Siaya	Male	Distributor
64.	Samuel Otieno	Siaya	Male	Trader Retail
65.	Dorca Adhiambo Okode	Siaya	Male	Input Suppliers
66.	Erick Odhiambo Onyango	Siaya	Male	Aggregator
67.	Eunice Awinja.	Siaya	Male	Trader Retail
68.	Jane Atieno	Siaya	Male	Producer
69.	Emmaculate Auma	Siaya	Male	Producer
70.	Omondi Yusebias	Siaya	Male	Producer
71.	Benter Achieng	Siaya	Male	Trader Retail
72.	Vincent Omondi	Siaya	Female	Processor

S/No	Names	Location	Gender	Value Chain Level
73.	Victor Otieno Aloo	Siaya	Male	Producer
74.	Kevin Otieno Okoth	Siaya	Male	Producer
75.	Amos Ochieng	Siaya	Male	Producer
76.	Brenda Adhiambo	Siaya	Male	Input Suppliers
77.	Felix Ochieng'	Siaya	Male	Producer
78.	Quintet Auma	Siaya	Female	Trader Retail
79.	Samson Olweny	Siaya	Female	Producer
80.	Charity Atieno	Siaya	Female	Trader Retail
81.	Reghan Ochieng'	Siaya	Female	Processor
82.	Kelvin Omondi	Siaya	Male	Input Suppliers
83.	Moses Ochieng	Siaya	Female	Aggregator
84.	Brian Ochieng Onyango	Siaya	Male	Producer
85.	Albert Owuor	Siaya	Male	Producer
86.	Jack Mourice Otieno	Siaya	Male	Aggregator
87.	Vincent Juma	Siaya	Female	Producer
88.	Oliver Otieno	Siaya	Female	Processor
89.	Issach Owino	Siaya	Male	Input Suppliers
90.	Benson Ochieng Ogolla	Siaya	Male	Producer
91.	Felix Otieno	Siaya	Male	Trader Retail
92.	Quinter Anyango	Siaya	Female	Processor
93.	Elvis Loma	Siaya	Female	Aggregator
94.	Vera Akinyi	Siaya	Male	Processor
95.	Benter Akongo	Siaya	Female	Processor
96.	Vincent Ochieng	Siaya	Female	Producer
97.	Jane Florence	Siaya	Female	Trader Retail
98.	Gilbert Oluoch	Siaya	Female	Processor
99.	Claudio Otieno	Siaya	Male	Producer
100.	Anna Akoth Otieno	Siaya	Male	Input Suppliers
101.	Linder Achieng	Siaya	Female	Processor
102.	Mourice Agutu Achieng	Siaya	Male	Processor
103.	Ishmael Otieno	Siaya	Female	Processor
104.	Beatrice Achieng	Siaya	Male	Input Suppliers
105.	Thaddeus Oduol	Siaya	Male	Producer
106.	Loice Awino	Siaya	Female	Aggregator
107.	David Ambrose Ochieng	Siaya	Female	Trader Retail
108.	Reagan Ronald	Siaya	Female	Trader Retail
109.	Eunice Anyango	Siaya	Female	Aggregator
110.	Jeremy Okello	Siaya	Female	Producer
111.	Henrietta Atieno	Siaya	Female	Trader Retail
112.	Aderi Joshua	Siaya	Male	Producer
113.	Charles Opiyo	Siaya	Male	Processor
114.	Milka Okumu	Siaya	Male	Trader Wholesale

S/No	Names	Location	Gender	Value Chain Level
115.	Janet Amolo	Siaya	Male	Input Suppliers
116.	Pamella Akinyi	Siaya	Male	Input Suppliers
117.	George Otieno	Siaya	Female	Producer
118.	Lucy Awour	Siaya	Female	Producer
119.	Anastasia Odhiambo	Siaya	Female	Producer
120.	Awuor Odemba	Siaya	Female	Trader Retail
121.	Meshack Owii	Siaya	Male	Processor
122.	Christopher Ochieng	Siaya	Female	Aggregator
123.	Wilfred Odhiambo	Siaya	Male	Input Suppliers
124.	Zilmark	Siaya	Male	Producer
125.	Lucy Awour	Siaya	Male	Aggregator
126.	Eunice Akoth	Siaya	Male	Producer
127.	Jane Awino	Siaya	Female	Trader Retail
128.	Francis Ogombe	Siaya	Male	Producer
129.	Nk	Siaya	Male	Processor
130.	Denise	Siaya	Female	Producer
131.	Abraham	Siaya	Male	Aggregator
132.	Antony Owino	Siaya	Female	Trader Retail
133.	Leyla Wanda	Siaya	Female	Processor
134.	Francis Ombok	Siaya	Female	Processor
135.	Bonface Angote	Siaya	Male	Trader Retail
136.	Mornica Ochilo	Siaya	Male	Producer
137.	Merik Ojigo	Siaya	Female	Processor
138.	Quinter Atieno	Siaya	Male	Input Suppliers
139.	Esther Akinyi	Siaya	Female	Input Suppliers
140.	Rose Oyugi.	Siaya	Male	Aggregator
141.	Dickson Alaro.	Siaya	Male	Processor
142.	Robert Olwande	Siaya	Male	Input Suppliers
143.	Joyce Opiyo	Siaya	Male	Producer
144.	Shem Okumu.	Siaya	Female	Processor
145.	Ruth Ombul	Siaya	Male	Producer
146.	Clive Otieno	Siaya	Male	Aggregator
147.	Kevin Onyango	Siaya	Female	Producer
148.	Elvis Ongare	Siaya	Male	Trade Retail
149.	Martin Odhiambo	Siaya	Female	Producer
150.	Felistar Okandi	Siaya	Female	Input Suppliers
151.	Allan Odongo	Siaya	Male	Producer
152.	Grace	Siaya	Male	Aggregator
153.	Paul Odhiambo Apiyo	Siaya	Male	Producer
154.	Reba	Siaya	Female	Processor
155.	Mary Omondi	Siaya	Female	Aggregator
156.	Dan Otieno	Siaya	Male	Producer

S/No	Names	Location	Gender	Value Chain Level
157.	George Omollo	Siaya	Female	Producer
158.	Collins Otieno	Siaya	Male	Aggregator
159.	Millicent Atieno	Siaya	Male	Producer
160.	Joyce Awuor	Siaya	Female	Processor
161.	Hilary Ogutu	Siaya	Male	Input Suppliers
162.	John Aol	Siaya	Female	Trader Retail
163.	Millicent Odhiambo	Siaya	Female	Producer
164.	Fredrick Onyango	Siaya	Male	Input Suppliers
165.	Pamela Achieng	Siaya	Female	Processor
166.	Dorothy Awino	Siaya	Female	Trader Retail
167.	Edwin Okoth	Siaya	Female	Producer
168.	Lilian Atieno	Siaya	Male	Producer
169.	Rose Atieno	Siaya	Male	Producer
170.	Otieno	Siaya	Male	Producer
171.	Victor Omondi	Siaya	Male	Producer
172.	Denise Otieno.	Siaya	Male	Aggregator
173.	James Agega	Siaya	Female	Processor
174.	Albright Awuor.	Siaya	Female	Aggregator
175.	Sylvia Oyier	Siaya	Female	Aggregator
176.	Peline Ogembo.	Siaya	Female	Aggregator
177.	Sharon Odera.	Siaya	Male	Trader Wholesale
178.	Moly Adongo	Siaya	Female	Processor
179.	Naomi Nammy	Siaya	Female	Processor
180.	Antonet Muga	Siaya	Female	Processor
181.	Borghut Saka	Siaya	Male	Producer
182.	Meshack Otieno	Siaya	Male	Trader Wholesale

3. Value Chain Actors

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
1.	Apollo Oware	Avocado	Male	Input Supplier	Siaya
2.	Eveline Awuno	Avocado	Female	Retailer/Wholesaler	Siaya
3.	Emily Anyango	Avocado	Female	Aggregator	Siaya
4.	Joseph Ayar	Avocado	Male	Input Supplier	Siaya
5.	Joyce Akinyi Odiwuor	Avocado	Female	Retailer/Wholesaler	Siaya
6.	Susan Aluoch	Avocado	Female	Processor	Siaya
7.	Sande Michael	Avocado	Male	Input Supplier	Siaya
8.	Florence Odhiambo	Avocado	Female	Processor	Siaya
9.	Rose Adongo	Avocado	Female	Retailer/Wholesaler	Siaya
10.	Jennifer Otiende	Avocado	Female	Aggregator	Siaya
11.	Jane Aketch Oloo	Avocado	Female	Retailer/Wholesaler	Siaya
12.	Frederick Otieno Omollo	Avocado	Male	Input Supplier	Siaya

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
13.	Joash Omwami	Avocado	Male	Processor	Siaya
14.	Jerry Ochieng	Avocado	Male	Aggregator	Siaya
15.	Simon Gombe	Avocado	Male	Input Supplier	Siaya
16.	Mike Ochieng	Avocado	Male	Retailer/Wholesaler	Siaya
17.	Isaac Jaovacado	Avocado	Male	Aggregator	Siaya
18.	Alice Anyango	Avocado	Female	Processor	Siaya
19.	Victor Otieno	Avocado	Male	Aggregator	Siaya
20.	Alice Atieno	Avocado	Female	Retailer/Wholesaler	Siaya
21.	Brenda Achieng	Avocado	Female	Processor	Siaya
22.	Kennedy Owuor	Avocado	Male	Aggregator	Siaya
23.	Andrew Otieno	Avocado	Male	Input Supplier	Siaya
24.	Sylvanus Omondi	Avocado	Male	Retailer/Wholesaler	Siaya
25.	Lowrence Mukabani	Dairy	Male	Aggregator	Kakamega
26.	Dancan Sabwa	Dairy	Male	Input Supplier	Kakamega
27.	Douglas Nayembea	Dairy	Male	Input Supplier	Kakamega
28.	Noah Shilabula	Dairy	Male	Input Supplier	Kakamega
29.	Julius Kasayi	Dairy	Male	Input Supplier	Kakamega
30.	Joel	Dairy	Male	Retailer/Wholesaler	Kakamega
31.	Alice Aseyo	Dairy	Female	Retailer/Wholesaler	Kakamega
32.	Jane Kizito	Dairy	Female	Aggregator	Kakamega
33.	Roseline Mudogo	Dairy	Female	Retailer/Wholesaler	Kakamega
34.	Rebecca Akhono	Dairy	Female	Aggregator	Kakamega
35.	Pius Angatia	Dairy	Male	Aggregator	Kakamega
36.	Modester Kanila	Dairy	Female	Aggregator	Kakamega
37.	Jacklyn Muronji	Dairy	Female	Processor	Kakamega
38.	Joseph Makumi	Dairy	Male	Aggregator	Kakamega
39.	Moo's Bridge Muunga-no Dairies Society	Dairy	Female	Processor	Kakamega
40.	Mary Nekesa	Dairy	Female	Aggregator	Kakamega
41.	Linah Cherotich	Dairy	Female	Aggregator	Kakamega
42.	Mary Cherotich	Dairy	Female	Retailer/Wholesaler	Kakamega
43.	Steven Samoei	Dairy	Male	Retailer/Wholesaler	Kakamega
44.	Rodah Ambuka	Dairy	Female	Input Supplier	Kakamega
45.	Philip Imbote	Dairy	Male	Processor	Kakamega
46.	Electin Liyayi	Dairy	Female	Retailer/Wholesaler	Kakamega
47.	Bonfes Chela Luyakha	Dairy	Male	Input Supplier	Kakamega
48.	Pracky Kweyu	Dairy	Female	Input Supplier	Kakamega
49.	George Kataka	Dairy	Male	Processor	Kakamega
50.	Job Abuko	Dairy	Male	Input Supplier	Kakamega
51.	James Agrey Mukolwe	Fish	Male	Producer	Kakamega
52.	Lorna Anyula	Fish	Female	Retailer/Wholesaler	Kakamega
53.	Mathews Welimo	Fish	Female	Aggregator	Kakamega

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
54.	Evans Okacha	Fish	Male	Input Supplier	Kakamega
55.	Wairimu Loice	Fish	Male	Aggregator	Kakamega
56.	Kennedy Sakwa	Fish	Male	Aggregator	Kakamega
57.	Everyone Matioli	Fish	Female	Processor	Kakamega
58.	Lydia Oronje	Fish	Male	Aggregator	Kakamega
59.	Michael Makutsa	Fish	Male	Aggregator	Kakamega
60.	Dorine Atako	Fish	Female	Input Supplier	Kakamega
61.	Rose Anyona	Fish	Female	Aggregator	Kakamega
62.	Roseline Ashioya	Fish	Female	Retailer/Wholesaler	Kakamega
63.	Bibiana Makotsi	Fish	Male	Aggregator	Kakamega
64.	Roselyne Wawire	Fish	Female	Aggregator	Kakamega
65.	Alex Shiundu	Fish	Female	Processor	Kakamega
66.	Bonface Ogollah	Fish	Male	Retailer/Wholesaler	Kakamega
67.	Rhodah Habwe	Fish	Female	Aggregator	Kakamega
68.	Boaz Amalanda	Fish	Male	Retailer/Wholesaler	Kakamega
69.	Esther Khalisia	Fish	Female	Retailer/Wholesaler	Kakamega
70.	Job Muiruri	Fish	Female	Processor	Kakamega
71.	Emanuel Malele	Fish	Female	Aggregator	Kakamega
72.	Dinah Raluoch	Fish	Female	Processor	Kakamega
73.	Magdalene Makokha	Fish	Female	Retailer/Wholesaler	Kakamega
74.	Alex Opaka	Fish	Female	Processor	Kakamega
75.	Daniel Khwesa	Fish	Male	Processor	Kakamega
76.	Grace Aketch Manyala	Fish	Male	Processor	Siaya
77.	Kennedy Aliwa Aboka	Fish	Female	Processor	Siaya
78.	Edward Oyier(Asara)	Fish	Female	Input Supplier	Siaya
79.	Edith Akinyi	Fish	Male	Retailer/Wholesaler	Siaya
80.	Mathews Odhiambo	Fish	Male	Input Supplier	Siaya
81.	Christine Okello	Fish	Male	Aggregator	Siaya
82.	Jane Akoth	Fish	Female	Input Supplier	Siaya
83.	Syprose Anyango	Fish	Male	Input Supplier	Siaya
84.	Moses Seda	Fish	Male	Input Supplier	Siaya
85.	Lilian Akinyi	Fish	Female	Input Supplier	Siaya
86.	Carlson Adhiambo	Fish	Female	Processor	Siaya
87.	George Odero	Fish	Male	Retailer/Wholesaler	Siaya
88.	George Onyango	Fish	Female	Retailer/Wholesaler	Siaya
89.	Benter Anyango	Fish	Female	Retailer/Wholesaler	Siaya
90.	George Sande	Fish	Female	Processor	Siaya
91.	Beryl Atieno	Fish	Female	Retailer/Wholesaler	Siaya
92.	Christine Auma	Fish	Male	Input Supplier	Siaya
93.	Madam Jane	Fish	Male	Input Supplier	Siaya
94.	George Odero	Fish	Female	Processor	Siaya
95.	Christine Anyango	Fish	Female	Retailer/Wholesaler	Siaya

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
96.	Jane Akoth	Fish	Female	Processor	Siaya
97.	Herine Akinyi Ochola	Fish	Female	Input Supplier	Siaya
98.	Beatrice Akinyi	Fish	Female	Retailer/Wholesaler	Siaya
99.	Margaret	Fish	Female	Input Supplier	Siaya
100.	Mercy Ojal	Fish	Male	Input Supplier	Siaya
101.	Musa Juma	Fish	Male	Input Supplier	Siaya
102.	Antony Chek	Mango	Male	Input Supplier	Siaya
103.	Mildred Adhiambo	Mango	Female	Processor	Siaya
104.	Florence Auma	Mango	Female	Retailer/Wholesaler	Siaya
105.	Syprose Garre Bonyo	Mango	Female	Retailer/Wholesaler	Siaya
106.	George Ododa	Mango	Male	Input Supplier	Siaya
107.	Pamela Atieno	Mango	Female	Retailer/Wholesaler	Siaya
108.	Eunice Achieng	Mango	Female	Aggregator	Siaya
109.	Jane Aoko	Mango	Female	Aggregator	Siaya
110.	Seline Anyango	Mango	Female	Processor	Siaya
111.	Mourine Achieng	Mango	Female	Retailer/Wholesaler	Siaya
112.	Rosemary Aloo	Mango	Female	Aggregator	Siaya
113.	Benter Awino	Mango	Female	Processor	Siaya
114.	Shem Owino	Mango	Male	Input Supplier	Siaya
115.	Emmanuel Omondi	Mango	Male	Input Supplier	Siaya
116.	Edwin Oriwa	Mango	Male	Processor	Siaya
117.	Moriuce Omondi	Mango	Male	Input Supplier	Siaya
118.	Paul Ochieng	Mango	Male	Aggregator	Siaya
119.	Teresia Otieno	Mango	Female	Input Supplier	Siaya
120.	Mary Anyuka	Mango	Female	Processor	Siaya
121.	Nicholas Ogutu	Mango	Male	Retailer/Wholesaler	Siaya
122.	Asha Midiga	Mango	Male	Retailer/Wholesaler	Siaya
123.	Maureen Awino.	Mango	Female	Processor	Siaya
124.	Perez Aoko	Mango	Female	Aggregator	Siaya
125.	Hellen Ogaja.	Mango	Female	Retailer/Wholesaler	Siaya
126.	Nicholas Odongo	Mango	Male	Retailer/Wholesaler	Siaya
127.	Jackline Nyarotso	Poultry	Male	Retailer/Wholesaler	Kakamega
128.	Ayub Ngigi	Poultry	Female	Aggregator	Kakamega
129.	Antony Kisero	Poultry	Male	Processor	Kakamega
130.	Patrice Achero	Poultry	Male	Retailer/Wholesaler	Kakamega
131.	Washington's Wamatsi	Poultry	Male	Trader	Kakamega
132.	Ismael Indimuli	Poultry	Male	Aggregator	Kakamega
133.	Patrick Barasa	Poultry	Male	Aggregator	Kakamega
134.	Mourice Oranga	Poultry	Male	Processor	Kakamega
135.	Carolyne Makonjio	Poultry	Male	Retailer/Wholesaler	Kakamega
136.	Lydia Wafula	Poultry	Female	Retailer/Wholesaler	Kakamega
137.	Douglas Agoyi	Poultry	Male	Aggregator	Kakamega

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
138.	Hadijah Rehema	Poultry	Male	Processor	Kakamega
139.	Shakila Mohamed	Poultry	Male	Retailer/Wholesaler	Kakamega
140.	Rachael Mbone	Poultry	Male	Retailer/Wholesaler	Kakamega
141.	Joseph Ochola	Poultry	Male	Aggregator	Kakamega
142.	Caroline Fromba	Poultry	Male	Retailer/Wholesaler	Kakamega
143.	Evans Alenga	Poultry	Male	Aggregator	Kakamega
144.	Loice Okoti	Poultry	Female	Aggregator	Kakamega
145.	Helima Rajab	Poultry	Male	Aggregator	Kakamega
146.	Bernard Sakwa	Poultry	Female	Input Supplier	Kakamega
147.	Dennis Nandwa	Poultry	Female	Aggregator	Kakamega
148.	Evans Okacha	Poultry	Male	Retailer/Wholesaler	Kakamega
149.	Bilha Merab	Poultry	Female	Aggregator	Kakamega
150.	Stanley Mutoli	Poultry	Female	Processor	Kakamega
151.	Millicent Keya	Poultry	Female	Retailer/Wholesaler	Kakamega
152.	George Odhiambo	Poultry	Male	Aggregator	Siaya
153.	Gabriel Otieno	Poultry	Female	Retailer/Wholesaler	Siaya
154.	Gabriel Sewe	Poultry	Female	Aggregator	Siaya
155.	Ambrose Aliwa	Poultry	Male	Input Supplier	Siaya
156.	Benson Ouma	Poultry	Female	Processor	Siaya
157.	Kevin Odhiambo	Poultry	Female	Processor	Siaya
158.	Achieng Odhiambo	Poultry	Male	Processor	Siaya
159.	George Okatch Siso	Poultry	Female	Retailer/Wholesaler	Siaya
160.	Samuel Lomo	Poultry	Male	Input Supplier	Siaya
161.	Walter Owaga	Poultry	Male	Aggregator	Siaya
162.	Betty Akinyi Abala	Poultry	Female	Retailer/Wholesaler	Siaya
163.	James Odhiambo	Poultry	Male	Retailer/Wholesaler	Siaya
164.	Rose Achingieng	Poultry	Female	Processor	Siaya
165.	Stephene Oriengo	Poultry	Female	Processor	Siaya
166.	Filkjgona Asuna	Poultry	Male	Input Supplier	Siaya
167.	Oreta Williis Martin	Poultry	Male	Input Supplier	Siaya
168.	Magret Adhiambo	Poultry	Female	Input Supplier	Siaya
169.	Sabina Wasonga	Poultry	Male	Input Supplier	Siaya
170.	Patrick Kowanga	Poultry	Male	Retailer/Wholesaler	Siaya
171.	George Naulonda	Poultry	Female	Processor	Siaya
172.	Sharon Kahenda	Poultry	Female	Processor	Siaya
173.	Sarafina Holel	Poultry	Female	Input Supplier	Siaya
174.	Carren Akinyi	Poultry	Male	Aggregator	Siaya
175.	Hassan Omogi	Poultry	Female	Retailer/Wholesaler	Siaya
176.	Monica Adongo On-yango	Poultry	Female	Aggregator	Siaya
177.	Dorothy Chiando	Poultry	Female	Input Supplier	Siaya
178.	Margaret Akinyi Awich.	Poultry	Female	Input Supplier	Siaya

S/No	Name	Value Chain	Gender	Value Chain Actor	Location
179.	Lilian Arara	Poultry	Female	Aggregator	Siaya
180.	Lilian Owino	Poultry	Male	Aggregator	Siaya
181.	Melvin Otieno	Poultry	Female	Input Supplier	Siaya
182.	Nicholas Odhiambo	Poultry	Male	Processor	Siaya
183.	Moses Shikwati	Soya	Male	Retailer/Wholesaler	Kakamega
184.	Salome Muganda	Soya	Female	Retailer/Wholesaler	Kakamega
185.	Ali Otini	Soya	Male	Retailer/Wholesaler	Kakamega
186.	Habakkuk Khamala	Soya	Male	Input Supplier	Kakamega
187.	Samuel Akollo	Soya	Male	Aggregator	Kakamega
188.	Hussein Akida	Soya	Male	Retailer/Wholesaler	Kakamega
189.	Monica Rapando	Soya	Female	Retailer/Wholesaler	Kakamega
190.	John Ashitiva	Soya	Male	Aggregator	Kakamega
191.	Jacqueline Wafula	Soya	Female	Processor	Kakamega
192.	Elizabeth Orembe	Soya	Female	Processor	Kakamega
193.	Ramadhan Onyango	Soya	Male	Aggregator	Kakamega
194.	Caroline Nyakoa	Soya	Female	Processor	Kakamega
195.	Rachel Netia	Soya	Female	Aggregator	Kakamega
196.	Joseph Isiongo	Soya	Male	Input Supplier	Kakamega
197.	Julius Msashi	Soya	Male	Aggregator	Kakamega
198.	Daniel Madegwa	Soya	Male	Processor	Kakamega
199.	Silas Ambetsa Kutima	Soya	Male	Processor	Kakamega
200.	Roselydia Alwang'a	Soya	Female	Processor	Kakamega
201.	Samuel Akollo	Soya	Male	Aggregator	Kakamega
202.	Lazarus Titiya	Soya	Male	Retailer/Wholesaler	Kakamega
203.	Silvanus Omurunga	Soya	Male	Aggregator	Kakamega
204.	Silvia Andai	Soya	Female	Input Supplier	Kakamega
205.	Lawrence Mukabana	Soya	Male	Input Supplier	Kakamega
206.	Joseph Isiongo	Soya	Male	Input Supplier	Kakamega
207.	Ben Chesoni	Soya	Male	Input Supplier	Kakamega
208.	Clifford Oseni	Soya	Male	Aggregator	Kakamega
209.	Linet Ochanda	Soya	Female	Aggregator	Kakamega

4) Key Informants

S/No	Name	Position	Location
1.	Hon Racheal Okumu	CECM, Agriculture & Livestock	Kakamega
2.	Hon Kasim Were	CECM, Youth Affairs	Kakamega
3.	Jeremiah Namunyu	Chief Officer, Agriculture	Kakamega
4.	Dr Kelly	Chief Officer, Livestock	Kakamega
5.	Dr Otsieno	Director, Livestock	Kakamega
6.	Hillary Onjoro	Director, Agriculture	Kakamega
7.	Benard Kangale	Director of Cooperatives	Kakamega
8.	Eng. Wakhungu	Director of Irrigation	Kakamega

S/No	Name	Position	Location
9.	Mr Wanyama	Director Livestock Production Officer	Kakamega
10.	Zephania Otieno	Director, Fisheries	Kakamega
11.	John Aswa	Director of Youth Affairs	Kakamega
12.	Ben Makori	County Gender Officer	Kakamega
13.	Moffat Mandela	Governor's PA, Youth Affairs	Kakamega
14.	Timothy Wanjala	Sub County Cooperative Officer	Kakamega
15.	Simion Ndungu	Sub County Agribusiness Officer/ FAO Liaison Officer	Kakamega
16.	Mr Mukhwana	Sub County Agricultural Officer	Kakamega
17.	Mr John Manyasia	Ward Agricultural Officer	Kakamega
18.	Benson Manya	Sub County Agribusiness officer	Kakamega
19.	Ms Metrine N. Muricho	Principal, Bukura Agricultural Training College	Kakamega
20.	Mr Charles Wamanchi	Ward Agricultural Officer and acting crops officer	Kakamega
21.	Philip Mukwana	SCAO	Kakamega
22.	Andrew Opwolo	SCAO	Kakamega
23.	Joyna Waboyabo	Kakamega County Dairy Development Cooperative (KCDDC)	Kakamega
24.	Mr Ouma	Sub County Livestock Officer	Kakamega
25.	Mr Ligono	Sub County Livestock Officer	Kakamega
26.	Dr Okutoyi	KARLO	Kakamega
27.	Ms Muricho	Bukura Agricultural Centre	Kakamega
28.	Mr Joseph Mutuku Mr Clepenton Mwenesi	Bukura Agricultural College	Kakamega
29.	Titus Ogude	AFC	Kakamega
30.	Thomas Dirir	KCB	Kakamega
31.	Joseph Oyieko	KIE	Kakamega
32.	Michael	Sustainable Organic Farming & Development Initiative (SOFDI)	Kakamega
33.	Alex Mutua	Mabi Agri	Kakamega
34.	Lilian Avugwi	One Acre Fund	Kakamega
35.	Jane	Kakamega Bidii	Kakamega
36.	Sylvia Wafula	RTI	Kakamega
37.	Gabriel Liyai	Kakamega County Youth Agribusiness	Kakamega
38.	Jane Musungu	Techno serve	Kakamega
39.	John Matende	Matende Hostein Farm	Kakamega
40.	Sammy Akolo	Anglican Development Services	Kakamega
41.	Fr Ngatia	Mukumu Gursey Farm	Kakamega
42.	Albert Ochenje	ASDSP coordinator	Kakamega
43.	Joseph Khisaka	GIZ	Kakamega
44.	Samuel Wambisa	County Cooperative Director	Siaya
45.	Julius Okoth	SCADA	Siaya

S/No	Name	Position	Location
46.	Maurice Rangoma	County Livestock Director	Siaya
47.	Ken Owuor	ASDCP Coordinator	Siaya
48.	Vincent Okoth	County Director of Agriculture (Ag)	Siaya
49.	Kevin Odhiambo	ATDC Engineer	Siaya
50.	Joy Kambwiria Ochieng	SCAO Rarieda	Siaya
51.	Dr Elizabeth Odhiambo	Agriculture CEC	Siaya
52.	Willis Ating	Kenya Climate Smart Agriculture Programme	Siaya
53.	Sarah Mbogo	Youth Agribusiness Officer	Siaya
54.	Joseph Wanguhu	Lower Nzoia Irrigation Project	Siaya
55.	Moses Nyongesa	Lower Nzoia Irrigation Project	Siaya
56.	Charles Siso	Chief Officer, Agriculture, livestock and fisheries	Siaya
57.	Benta Akoth Aketch	Siaya County Agribusiness Platform	Siaya
58.	Herine Okoth	Dep Principal, Siaya Advance Siaya Institute of Advanced Technology (SIAT)	Siaya
59.	Joshua Okumo	Sub County Agricultural Officer - Bondo	Siaya
60.	Jared Awiti	World Vision	Siaya
61.	Mark Wanyama	KCB Bank Ltd, Business Banker	Siaya
62.	Benta Akoth Aketch	Siaya Youth in Agribusiness Association	Siaya
63.	Joseph Ndonga Muyai	Koi Self Help Group	Siaya
64.	Collins Ndessy	Youth Enterprise Development Fund	Siaya
65.	George Oketch	Women Enterprise Fund	Siaya
66.	Felista Lutta	Youth Enterprise Development Fund	Siaya
67.	Moses Ogenche	Weitunga Heifner	Siaya
68.	Sam Akolo	Anglican Development Services (AND)	Siaya

5) Focus group discussions

S/No	Name	County	Value chain	Actor
1.	Censo Motor Bikes SHG	Kakamega	Soya	Producer
2.	Mushinaka Self Help Group	Kakamega	Soya	Producer
3.	CleanShed Farmers Group	Kakamega	Soya	Producer
4.	Emusaka Youth Bunge	Kakamega	Poultry	Producer
5.	Shironyanga	Kakamega	Poultry	Producer
6.	New Era Youth Group	Kakamega	Poultry	Producer
7.	Future makers poultry group	Siaya	Poultry	Producer
8.	Olwa Self Help Group	Siaya	Poultry	Producer
9.	Moyie Women Group	Siaya	Poultry	Producer
10.	Central Marama Aqua Culture Field School	Kakamega	Fish	Producer
11.	SEHEP Self Help Group	Kakamega	Fish	Producer
12.	Nzoia Youth AFC SHG	Kakamega	Fish	Producer
13.	Crescendo Welfare Group	Kakamega	Dairy	Producer

S/No	Name	County	Value chain	Actor
14.	Marakusi Self Help Group	Kakamega	Dairy	Producer
15.	Springfield Farmers' Cooperative Society	Kakamega	Dairy	Aggregator
16.	Busy Queen Enterprises	Siaya	Avocado	Processor
17.	Sparrow Youth Processors	Siaya	Mango	Processor
18.	Futro Village Youth Group	Siaya	Tree Seedlings	Producer
19.	Alego Young Turks Group	Siaya	Cage Fish Farming	Producer

Appendix vi: participants, stakeholder validation workshops

1. **Siaya County - 22 March 2021**

S/No	Name	Organization Name	Email Address	Gender (M/F)
1.	Judy Maina	FAO	Judy.Maina@fao.org	F
2.	Andrew Mwaura	FAO	Andrew.Mwaura@fao.org	M
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4.	Philip Oketch	Victoria	oketchphilip@gmail.com	M
5.	Stephen Oketch	FAO-ICA	steveoketch@yahoo.com	M
6.	Ken Owuor	ASDSP		M
7.	Susan Aruwa	ASDSP	srawalo@yahoo.com	F
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9.	Pius Ng'ang'a	Capital Strategies Ltd	piuskn@yahoo.com	M
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11.	Ali Mbuvi	Equity Bank	mbuvidavid4@gmail.com	M
12.	Dorothy Awino Oinga	SPARROW	dorothyawino25@yahoo.com	F
13.	Christine Atieno	ASDSP II	catieno07@gmail.com	F
14.	Alloys J. Owino	Mango VCP	aloysjosephowino@yahoo.com	M
15.	Felix O. Ouma	Youth Empowerment	felixcalebouma@gmail.com	M
16.	Robert Otieno	Romery Production	romeryfarm@gmail.com	M
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18.	Sarah L. Mango	Department of Agriculture Livestock and Fisheries	geolerloiz@gmail.com	F
19.	William Odhiambo	Hospital View Youth Group	otienow844@gmail.com	M
20.	Benard Odhiambo Omunchi	Bedo Agrovet	benardomunch35@gmail.com	M
21.	Maustine Oyoo	K.I.E Ltd	maustinefally@gmail.com	M
22.	Samuel Odhiambo	Future Makers SHG	samuelodhiambo514@gmail.com	M
23.	Fredrick Were	Siaya County Agribusiness Platform (SCAP)		M
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26.	Ayayo Lavender	Hospital View Youth Group	ayayolavender@gmail.com	F
27.	Christopher Okello	Uradi Youth Group	chrisokello3@yahoo.com	M

2. Kakamega County - 24 March 2021

S/No.	Name	Organization Name	Email Address	Gender (M/F)
1.	Tito Arunga	FAO	Tito.Arunga@fao.org	M
2.	Priscah Asuko	Farmer		F
3.	Elizabeth Wabwire	Farmer		F
4.	Robert Otuma	Farmer		M
5.	Zulpha Iminza	Farmer		F
6.	Rahma Ismael	Farmer		M
7.	Solomon Oluoch	Farmer		M
8.	Evans Okacha	Farmer	evansokacha@gmail.com	M
9.	Roselyne Wawire	Fish Farmer		F
10.	Judith Okutoyi	Fish Farmer		F
11.	Leah Atemi	Poultry Farmer-Kakamega Youth Agripreneur Association(KCYAA)	atemileah@gmail.com	F
12.	Noel Muchemo	Farmer	noelmuchemo@gmail.com	M
13.	Melque Mukokho	Dairy Farmer	melquemukokho@gmail.com	M
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15.	Dorcas Cherotich	Fisheries Officer	Cherotichdorcas29@gmail.com	F
16.	Bjorn Aswa	Ministry of Youth, County Govt	bjornaswani@yahoo.com	
17.	Shitoto Cliff	Fish farmer	Cliffbretcht6@gmail.com	M
18.	Zachary Mwaniki	Livestock Officer, County Govt	Zacharym987@gmail.com	M
19.	Sebastian Mangeni	Coordinator - KCYAA	sebamangeni@gmail.com	M
20.	Melack Oyalo	Poultry farmer	melleeksifuna@gmail.com	M
21.	Caroliyne Nyakoa	Farmer - KCYAA	Carolinenyako6@gmail.com	F
22.	John Mukoya Manyasa	Agricultural extension officer, Min of Agriculture	J23mukoya@yahoo.com	M
23.	Gabriel Litunya Akali	KCYAA	Kkyouth2018@gmail.com	M
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