



INTEGRATED MARKET SYSTEMS AND LOCAL VALUE CHAIN ASSESSMENT FOR FOOD SECURITY AND RESILIENCE IN TRANSITIONING ENVIRONMENT- FORESITE PROJECT, SOUTH SUDAN

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DEFINITION OF TERMS AS USED IN THE REPORT

Farmer Cooperative Society: Farmer-based and farmer-owned groups that support farmers in terms of negotiating for better price in the market, distribution of inputs as well as for roll out farmer-level training programs. Farmer cooperatives also help farmers to negotiate and procure bulk agricultural inputs at affordable price. The cooperative also plays an important role in terms of aggregating produced from members for on-ward shipment to the market.

Market-Oriented Production: Refers to the act of producing agricultural commodities with an aim of selling in the market. Market-oriented production starts with identifying commodities that fetch premium price in the market, then engaging in the production process as long as the prevailing agro-ecological conditions are suitable for the production of the crop.

Market Systems Approach: Market systems approaches seeks to address the underlying causes of poor performance in specific markets that matter to people living in poverty, in order to create lasting changes that have better impact to these people. Market system development focuses on determining root causes of market failure and supporting market players in order to benefit target beneficiaries; requires multiple intervention to make positive change in the marketing environment.

Market Structure: The concentration of sellers and buyers in the market, their size, location, constellation of the marketing channels, the extent of product differentiation, and the ease with which new firms enter a market (Abbott and Makeham, 1981; Kohls and Uhl, 1985). Also refers to the characteristics of the organization of markets, which strategically influence the nature of competition and pricing behaviour within market (Bain, 1968).

Price Transmission: Refers to how a change in price of a commodity at one market is passed on to another market in a market system (Mai, 2017; Asche *et al.*, 2012). In a market system, the existence of asymmetric price transmission is viewed as evidence of market failure.

Value Chain Analysis (VCA): A useful analytical tool that helps understand overall trends of industrial re-organization and identifying change agents and leverage points for policy and technical interventions. The process of VCA consists of breaking a value chain into its constituent parts in order to better understand its structure and function. The analysis consists of identifying chain actors at each stage and discerning their functions and relationships, determining chain governance or leadership to facilitate chain formation and strengthening. VCA scrutinizes interactions and synergies among actors and the business and policy environment.

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EXECUTIVE SUMMARY

In Cueibet County, 43% of the respondents were male while 57% were female. 52% of the respondents were in the age bracket 18-35 years while 29% were in the age bracket 36-45 years. Average household size is 10 persons. 73% of the respondents have not undergone formal education. 96% of the respondents stated that they rear local goats, 86% rear local cattle, 79% local chicken and 78% local sheep. Whereas the county is composed of five payams (Achol Malek, Malou Pec, Madit, Mayath and Ngap), its only in Achol Malek and Ngap payams where all the respondents (100%) rear cattle. 100% of the respondents produce sorghum, 100% of the respondents produce groundnut, 47% produce maize while 44% produce beans. Among all the payams, Mayath does better in maize production (70%) of the respondents engage in maize production in this payam). The main crops in the county are, therefore sorghum, groundnut, maize and beans. Most farmer plant their crops in the May to June season. The average farm size in Cueibet County is 4.3 feddans.

The main input used in the farms in the county are seeds and ox-plough that are obtained from previous harvest while some seeds are supplied by NGOs operating in the county. The main challenges faced by livestock producers are: high incidences of livestock ecto and endo-parasites recorded by 66% and 64% of the respondents, respectively, cattle rustling recorded by 91% of the respondents and lack of good quality pastures recorded by 54% of the respondents. The main challenges facing crop producers in the county are: high incidences of pests and diseases recorded by 85% of the respondents, excessive rainfall recorded by 76% of the respondents and lack of proper storage facilities recorded by 38% of the respondents. Only 22% of the respondents stated that they have been trained on crop and livestock production. More male farmers had been trained compared to their female counterpart. In terms of payams, Ngap (31%) and Madit (31%) had more trained farmers compared to Mayath (13%) which had the least trained farmers.

In Gogrial East County, 52% of the respondents interviewed were male while 48% were female. 45% of the respondents were in the age bracket 18-35 years while 43% were in the age bracket 36-45 years. The average household size is 8 persons. 71% of the respondents do not have formal education. On average farmers have 2.9 feddans of land. 75% of those interviewed rear goat, 75% rear indigenous chicken, 61% of the rear local cattle, while 55% rear local goats. 100% of the respondents are engaged sorghum production, 88% in groundnut production, 66% in maize production, 55% in millet production and 25% in beans production. The rainfall season is the month of May to June. Overall, only 39% of farmers in the county had been trained on crop and livestock production. Slightly more than half of the respondents in Tuoch West payam had been trained compared to 29% of those in Pathuon East. More female farmers (41%) had been trained compared to male farmers (38%). The main challenges facing livestock producer are: high incidences of livestock ecto-parasites (recorded by 51% of the farmers), cattle rustling (61%), high mortality rate among the livestock (49%), incidences of livestock endo-parasites (30%). In Pathuon East and Touch payams, cattle rustling is rife; with 62% incidence rate in Pathuon and 60% in Touch payams. Challenges faced crop producers are: high incidences of pests and diseases (75%), unpredictable rainfall pattern (55%) and excessive rain (42%).

In Jur River County, 46% of the respondents were male while 54% were female. The average household size was 8 members, split equally in terms of gender. 58% of the respondents did not

have formal education. The average size of land under crop farming in a year was 3.5 feddans per farmer. The main livestock reared in the county were goats, reared by 82% of the respondents, followed by sheep, indigenous chicken and goats. Notably, Cattle were mainly reared in Alel Thony and Maril Bai Payams. Only 3% of respondents in Udici payam. Rearing of local chicken was most common in Udici and Marial Bai payams compared to Alel Thony Payam. Overall, 99% of all the respondents surveyed in this county produced sorghum and 97% groundnuts. The other main crops in the county included; maize, sesame, beans, millet, okra and tomatoes. Notably, sorghum and groundnuts were produced by all respondents in Udici and Marial Bai payams. The county had one main crop planting season which occurred between May and June. Most farmers (83%) planted their crops during this season.

The main inputs used by farmers in the county were seeds (72%), malodas (56%), hoes (52%) and manure (33%). These were used across all the payams. Pesticides were only used in Udici payam, and only by 3% of the respondents. Overall, only 31% of farmers in the county had been trained on crop production or livestock production. Udici payam had the most trained farmers while Marial bai had the lowest. More male farmers (34%) had been trained compared to female farmers (29%) as shown below. The main challenges in crop production in the county are: high incidences of pests and diseases (92%) followed by unpredictable rainfall (79%) and lack of proper storage facilities and excessive rain (27%).

In Twic County, 65% of the respondents were female while 35% were male. 56% of the respondents were in the age bracket 18-35 years while 30% were in the age bracket 36-45 years. The average household size per respondent was 8 persons. 70% of the respondents are not educated indicating low literacy level in the county. The average land size per farmer is 2.8 feddans. The main livestock reared in the county are: goats (reared by 75%), followed by local cattle (reared by 64%), local/indigenous chicken (reared by 43%) and sheep reared by 41% of all the respondents. This trend was similar across all the payams. Donkeys were only reared by farmers in Wunrok payam. All the respondents (100%) in this county engage in sorghum production. Other crops being produced in the county are maize (produced by 82% of the respondents), groundnut (produced by 73% of the respondents), beans (produced by 43% of the respondents) and millet (produced by 23% of the respondents). Sorghum, groundnut and maize are major agricultural commodities in Aweng, Turalei and Wunrok payams; over 60% of the respondents produced these commodities in the payams. The county had one main crop planting season which occurred between May and June. Most farmers (93%) planted their crops during this season. The main inputs used by farmers in the county were seeds, malodas, hoes and manure. These are used in all the payams. 40% of farmers in the county have been trained on crop and livestock production. 50% of the male farmers had been trained compared to only 34% of female farmers. The main challenge faced by crop farmers in the county is high incidences of pests and diseases (78%) followed by excessive rain that destroyed crops (64%) and unpredictable rainfall (53%). The main challenge in livestock production in the county included high incidences of livestock ecto-parasites (59%) and endo parasites (52%), high livestock mortality rates (50%), lack of quality pastures (48%) and cattle rustling (46%)

In terms of training and capacity building, there is a need to develop simplified training manuals in local languages and thereafter build the capacities of the farmers in these locations. Given

the low level of education among the farmers, it is recommended that the training follow a practical approach using demonstration farms preferably via the “Kolb’s adult learning cycle” (experience, reflection, generalization and application). Further, in this era of agricultural commercialization, “market-oriented extension training” that focuses on production of crops with ready market, will be beneficial to the farmers in the priority FORESITE project locations.

Given the lack of high quality agro-chemicals, there is a need to make use of locally available methods of pest and disease control such as cultural methods (adhering to farm-hygiene, removal of weedy plants, early planting, uprooting and burning or burying infected crops and crop residues, adhering to crop rotation to break pest and disease cycles, among others. Equally important, there is a need for the project to experiment on biological control methods such as “neem tree” extract; and document the results. When found to be effective, explore the feasibility of scaling-up usage of the product. Further, it will be of paramount importance to identify lead firms that could be supported to provide high quality livestock health products such as acaricides (Armitraz 12.5%w/v), anti-helminthic (levamisole-oxyclozanide, albendazoles) and other miscellaneous veterinary-ethical products and embedded services to the farmers.

It will be important to establish VSLAs where non-exist, and where they exist, more training to be provided to members on enterprise management and marketing. Whereas more than 50% of the respondents in Gogrial East, Jur River and Twic stated they members of a farming / cooperative group, while only 12.5% in Cueibet had membership of a farming group, the cooperatives operate not as cooperative but rather as farmer groups. There is a need to increase capacity building of these groups on cooperative governance and marketing as they transform into viable business entities. Critical support required by the farmer groups were identified as: technical training on agronomy; business training, market training, and training on construction of proper storage units. Training should be tailor-made in these areas.

In terms of political-economy analysis (PEA), the violence witnessed in Cueibet County a few years ago have largely subsided albeit for occasional cattle rustling and revenge and counter-revenge attacks flared by inter-communal feuds that still happens in the county. The situation is exacerbated by the fact there is still a significant number of weapons in the hands of civilian in the county. This create a state of insecurity and retards economic growth as would-be investors shy away from the county. The end result is insignificant political-economic development, yet the county has rich resources in the form of arable land and climatic condition suitable for crop and livestock production. There is a need for dialogue between key stakeholders to resolve the insecurity situation in the county. Additionally, there is a need for a comprehensive disarmament program of the communities living in the county as well as other surrounding locations of Warrap and Lake State. Equally important is the need for a concerted effort by governmental and non-governmental organizations to educate the populace on the benefit of peaceful co-existence, influence behaviour change, and provide capacity building on different economic activities including farming as a business, in order to realise peace and tranquility.

In terms of market systems analysis, the grain market segment is composed of market structure mainly dominated by retailers; their scale of operation is quiet low with limited constellation of market channels and limited product differentiation. Sorghum and maize grains are mainly sold

in grain form and also processed into flour, while groundnut is sold as unshelled, shelled and groundnut paste. The livestock slaughter houses exist in the locations, but the facilities are quite basic. Whereas local chicken is a potential value chain in the priority project counties given the premium price the birds fetch in the market, the potential for the chicken as income-earner is great. While the assessment results show that the farmers keep chicken, the average flock size per household is quite limited, yet the birds can act as alternative income source as well as meet the nutritional requirement of homestead. Future investment in this sub-sector should target disease control, construction of standard chicken housing and investment on formulation of local chicken feed. The aim is to provide feed supplementation to the birds to enable them reach marketable weight at 4-5 months as opposed to currently 7-10 months.

Recommendations to address the gaps in the market are: engage emerging local seed companies to produce seed on behalf of the FORESITE project beneficiaries, or import foundations seeds and provide technical support on community-based seed production or conduct adaptive trials of seeds produced in other locations. There is also a need to formalize the informal governance system existing in the identified value chains: formalization should take place in the forms of introducing systems to govern the informal lending mechanisms, modernizing production and value addition systems using appropriate technologies, and support rejuvenation of farmer cooperative (read groups) in terms of developing constitutions, by-laws, board charters and operating manuals, strategic plans and business plans.

In terms of market system development, possible intervention strategies are as follows: improve on the market infrastructure by constructing standard stalls in the markets, establish sanitary system in the market, improve on the road infrastructure, remove the multiplicity of marketing fees and taxes, standardize the units of commodity measurement (kilograms as opposed to “malwa” cups, basins and buckets), build the capacities of the government staff to provide market-oriented extension services, improve on the market information system by creating county market information board, discourage issuance of freebies and encourage agribusiness development and growth, increase access to affordable line of credit among farmers via provision of seed capital to village enterprise and loan association (VSLA), establish “Centers for Agricultural Technology and Commercialization” (CATC) in each of the project county to promote new technologies of agricultural production and agribusiness value-addition: The core mandate of the CATC should include among others; design and development and fabrication of for example mobile manually-operated threshers and winnowers, manual maize shellers, manual grinder and milling units, etc. The CATC can also be used for training of artisanal processors and other MSME agri-business entrepreneurs.

MARKET SYSTEM ANALYSIS FOR AGRICULTURAL COMMODITIES

In the core of the market systems in the FORESITE project counties of Cueibet, Gogrial East, Jur River and Twic, the role of women and men are clearly defined; there is division of responsibilities between the women and men folks at the household level. The cattle are used as “currency” in the counties, and the bulk of the money is stored in the form of cattle. The men are the ultimate decision-makers in matters pertaining to sell of cattle. The women mainly work in the farms producing crops for household consumptions, the surplus being taken to the market while the men take care of livestock. Whereas the men are the ultimate decision-maker, they

consult the women before decisions are made. Both women and men face several disadvantages in the marketing environment given the fact that most of them have never undergone formal education (over 58% according to study). This disadvantage them when negotiating price of agricultural commodities and livestock in the market.

Several existing support functions and rules are hindering the marketing of grain and livestock in the priority counties. The marketplace in all the priority counties lack basic market infrastructure; the market is composed of poorly constructed stalls with torn tarpaulins, bamboo sticks, in some cases poorly constructed grass-thatched stalls are seen. Further, there are no proper sanitary facilities all the market centers. Marketing takes place in conditions that lack basic market infrastructure. In the livestock markets, transactions are conducted in the “open-air market” with no shade to protect traders from rain or sun; the livestock marketing system is conducted via “auction” mechanism; appointed market officials are tasked with facilitating this process.



Open air Cattle Market in Twic County. Market Assessment Photo (October 2020)

The business enabling environment is also fluid in nature characterized by formal and informal market fees and taxes. Agricultural commodity retailers pay monthly market tax of SSP500 in addition to other daily informal market participation fee ranging between SSP50 to SSP 100. The department of trade and industry / county municipal council are main players in these markets; they set the trading rules and regulation in these market; however, they also lack capacity to enforce the rules and regulations in the market place. The relationships between the key players in the market is governed by the nature of business: The currency being used as unit of exchange is the South Sudanese Pound (SSP). Barter trade also exist as an exchange mechanism. At Dilal market in Cueibet County, one bull sells for 10 goats. One bull also sells at a price range between SSP125,000-SSP200,000 depending on season. One goat sells for between SSP10,000 to SSP12,500.



Daily auction of goats at Dilal Market, Cueibet County. Market Assessment Photo (2020)

The lack of livestock health products (anti-helminthic, acaricides, veterinary ethical products, antibiotics) is a major challenge that impedes the development of livestock business in the four counties. Similarly, commercial grain production is held back by lack of access to high quality seeds. Farmers use commercial grains as seeds. The forces of demand and supply dictates the market prices. Service providers of agricultural commodity exist in the market in the form of artisanal grain millers. Milling fee depends on quantity of grains being milled.

A part from the monthly market tax and daily market participation fee being levied on traders, no embedded or hidden transaction costs are seen in the market. Informal lending mechanism from friend and relatives, and emerging VSLAs are also observed in the market. Positive “deviants” are also observed in the market especially in Twic and Jur River: traders who import grains from other counties by virtue of their financial strength and scale of operation determine the prices of agricultural commodities in these markets. The grain imports especially from Khartoum via the “Amied” distribution point finds its way into the main markets in Twic and Jur River County. Grains imports have the potential to destabilize local production in the near future.



Grain Wholesaler in the market in Twic County. Market Assessment Photo (October 2020)

Cross-border trade is necessitated by the demand gap created in the local markets. There are opportunities to link local agricultural producers with the grain importers. It is recommended that locally producers be supported to increase their scale of production, reduce production cost to meet local demand and thus substitute grain import from other locations.

No medium-scale to large agribusiness investments are seen in the four counties although emerging micro-enterprises engaged in agricultural value addition service space are observed in the main markets. In this category of business are the artisanal millers and groundnut paste-makers. These players in the agri-commodity value-added space are still in small in scale; they face challenges such as lack of spare parts for their milling units. Occasionally, they have to wait for spare parts to be transported from other counties. The performance of the markets in the four counties is skewed in favour of wholesalers who have more governance power in marketplace.

In Cueibet County, the occasional insecurity situation depresses commercialization of livestock production. Cattle rustling coupled with high number of weapons in the hands of civilians has created a business environment characterized by uncertainty. Given the advent of COVID-19 pandemic, transactions have changed in the priority counties: the pandemic has caused significant reduction in the volume of grain imported from Uganda and Khartoum due to limited movement of traders; this has resulted to a spike in prices of local produce.



Grain Miller and milling unit in a market in Jur River County. Market Assessment Photo (September 2020)

Other challenges existing in the market system include: lack of standardized unit of measurement; cups, malwas, buckets and basins are used as unit for measuring grains in the marketplace as opposed to weighing scale. The main markets occasionally suffer from shortage of the major agricultural commodities because the seasonal nature of grain production. Consequently, grain demand outstrips supply during off-season production period.

Value addition units are still rudimentary in nature requiring process up-grading. Given the low level of education among the value chain players, written contracts are non-existent. The business relationship (formal and informal) is, therefore, underpinned by trust. Personalized relationships exist in the market where trust is built over time through repeated transaction. Although this relationship is non-contractual and informal, it is considered a very effective mechanism that facilitate business in the marketplace. Large-scale commercial production requires readily available energy source which is unavailable in the project locations. This impede the pace of agricultural commercialization. While power is currently being installed in Juba, it may take a long time to be installed in the counties supported by the project. Further, power supply for large-scale commercialization only make sense if it's supply is consistent.

The recent fluctuation of the south Sudanese pound (SSP) against hard currencies has eroded the buying power of the consumers, and traders pay more for business transactions in the market. If this fluctuation of the SSP continues for a long time this may negate the achievement already made in the marketing environment in the project locations. Other potential risks identified are seasonal flooding that destroy road that facilitate marketing operations. Seasonal flooding especially in Cueibet and Gogrial Counties occasionally cut-offs the main roads making it difficult for farmers and traders to access market.

SECTION ONE: INTRODUCTION

1.1 Background to the Assessment

1.1.1 Agricultural Sector in South Sudan

South Sudan has great agricultural potential given the fact that 70 percent of the country has arable land suitable for crop production (CAMP, 2015). The main crops being produced in the country are sorghum, maize, rice, sunflower, cotton, sesame, cassava, beans and peanut, among others (CAMP, 2015). A number of vegetable and fruit crops such as onion, okra, tomato, eggplant, potato, banana, mangoes and lemons can also be grown in the country (CAMP, 2015). Given its long civil war and lack of capacity to engage in commercial production, the country imports agricultural and food commodities from Uganda, Kenya and northern Sudan (CAMP, 2015). Whereas the seed industry is still underdeveloped, the country has made some progress in breeding seed maize with help of development organizations and researchers such as: the PALOTAKA, NAMA and PITA hybrid varieties (AGRA, 2015). Attempts are also being made at following an “adaptive trial approach” to determine the productivity and efficacy of seeds developed in other geographical regions (countries) for local utilization.

While 95 percent of the country’s agricultural production is rain-fed, weather variability determines crop performance (SSADP, 2019). The country experiences uni-modal and bimodal rainfall regimes in most locations: the bi-modal areas cover much of the Greater Equatoria (Western, Central and Eastern Equatoria). The result is a range of growing seasons from 280-300 days in the southern part to 130-150 days in the northern parts. The agricultural challenges facing the country are part of the larger economic and infrastructural challenges since the last civil war ended two years ago. The main challenges facing the agricultural sector are: lack of agricultural-enhancing technologies, poor and inadequate infrastructure, weak entrepreneurial base, absence of commercial farming, ineffective extension services, weak markets, limited market information systems, lack of access to affordable credit, weak farmer organisations, preponderance of pests and diseases and insecurity in some locations (SSADP, 2019).

In terms of the monetary and fiscal issues, the central bank of South Sudan is presently facing difficulties controlling the fluctuation of the South Sudan Pound (SSP) against hard currencies. Experts have also posited that the low level of foreign reserve might further devalue the South Sudanese Pound (SSP) in the coming months, significantly reducing the country’s ability to import vital agricultural and food commodities. The country continues to experience negative economic growth due to volatile oil prices in addition to the current COVID-19 pandemic that has reduced economic activities including agricultural production.

1.1.1.1 Crop Production in South Sudan

Throughout South Sudan, sorghum and maize are generally the major cereals consumed. Sorghum is the predominant cereal in rural areas, particularly in the north, while in Juba, maize and wheat are more widely consumed. Crop production is mainly subsistence in nature characterised by low productivity, lack of skills on the part of producers and preponderance of pests and diseases (SSADP, 2019). Amid these challenges, the country’s agricultural producers

are still capable of producing crops for household need albeit on small-scale (SSADP, 2019). The use of inferior planting materials has also depressed crop productivity every season resulting to limited progress in agricultural commercialization (SSADP, 2019).

In urban areas, local diet is also based on maize flour (largely imported from Uganda) while sorghum is the predominant staple crop in rural areas. Upland land rice and ground nuts are also grown (especially in Aweil and Yambio) and contributes to farming household incomes in certain period of the year. In parts of Central Equatoria, sweet potato, yam, coffee, mangoes and papaya are commonly grown. Okra, cowpea, green gram, pumpkin and tobacco are also widely grown around homesteads. In 2019, maize production in the country was estimated at 100,000MT representing 11 percent growth when compared with the 2018 production figures (Thomas, 2020). The upward growth was attributed to ample rainfall that the equatorial region received then. The potential for cereal production is still high given the fact that most of the land in the country is still virgin land possessing great production potential (Thomas, 2020).

Distribution of seeds and agricultural tools and implements by non-governmental organisations (NGOs) is a short-term mechanism to stimulate agricultural productivity and production. However, in the long-run, this approach negates agribusiness development in the country as it creates a culture of dependency among the farming communities (SSADP, 2019). The quality of agricultural inputs and products entering the country cannot be verified given the fact that the country does not have an agricultural input policy (AIP) in place nor agricultural inspectorate department (AID). Agricultural inputs and products entering the country via the porous borders are, therefore, not certified. While there are teething challenges that prevent agricultural/agribusiness growth, plans have been placed by the government in collaboration with development actors to develop agricultural input (including resilience seed system) policies.

1.1.1.2 Environment in South Sudan

The agribusiness environment in South Sudan is still fluid with the business enabling environment varying from one location to another. Most agricultural commodities being consumed in the country are imported from Uganda and Kenya through the Nimule border point and from Khartoum through the Amied location (Market Survey, 2020). The Agribusiness environment in the country is made up of small and medium enterprise agricultural companies (MSMEs) operating in a commercial environment characterized by uncertainty and insecurity in some locations (Market Survey, 2020). In addition, poor road infrastructure continues to hamper access to market thus posing significant agribusiness development challenges in a country that is endowed with rich natural resources and ample rainfall (Survey, 2020).

The agribusiness industry is severely under-developed yet it present great potential in the country. Majority of the Micro, Small and Medium Enterprises (SMEs) are located in the Green Belt Zone (GBZ) of the country mainly Central Equatoria State (CES) with a few in Western and Eastern Equatoria States (WES). The lack of standard agro-processing facilities prevents the growth of the agribusiness processing sub-sector in the country. Ready-to-consume agricultural commodities (maize flour, wheat flour, groundnut, etc) imported from East Africa occupy a big market share in the agricultural commodity market space in the country.

Whilst most of the emerging MSMEs have potential to increase scale of operation, the challenges facing them are immense and, therefore, need urgent redress for real agribusiness development to be achieved in the country. These challenges range from poor/ inefficient production technology, lack of energy, to lack of technical and business skills. Amid these challenges, the MSMEs still play an important role in the primary value addition service space in the market centers within the country.

1.1.1.3 Agricultural Commodity Imports in South Sudan

South Sudan, given its import dependence, is exposed to international cereal and food price volatility (X-Border Thomas, 2020). The imports are occasioned by production gaps of major cereals crops (maize, sorghum, rice and groundnut). The main agricultural commodity imported into the country are: maize flour, maize grain, wheat flour, dry cassava chips, cassava flour, rice and sugar. Most of the cereal imports originate from the regional grain markets in Uganda, Kenya and Northern Sudan (X-Border Thomas, 2020).

Agricultural commodity imports coupled with devaluation of the South Sudanese Pounds (SSP) against hard currencies has in recent time led to decline in imports by 30-50 percent according to some estimate; the situation having been exacerbated by the negative effect of COVID-19 pandemic that has limited cross-border trade. This resulted to a sharp increase in grain price in Juba by a margin of 20-36 percent in early 2020. Agricultural commodity trade flow follows nine transport corridors, namely; Nimule border post to Juba, Juba to Bor, Juba to Yei, Juba to Rumbek, Ameid to Wau to Raga, Sudan Warwar to Aweil, Sudan to Fashoda to Tonga to Adok, and Ethiopia through Kuergeng to Paga Maiwut. The flow of agricultural commodities into the country is part of a large volume of informal cross-border trade coming from neighbouring countries which is not captured by official statistics Juba but is recognized for its scale and implication on local agricultural production and agribusiness development.

In the rural areas, the trading of agricultural commodities is largely informal, lacking governance system and in some locations barter trade exist. Units of measurements in the markets centers are not standardized: grains are weighed in terms of “malwa” (tins of different sizes), cups, basins and buckets. 1 malwa is approximately equal to 3.5kg, although this weighing system is contentious as the malwas being used in the markets are never equal in size. Some Malwas are estimated to weigh 3.75kg while the smaller malwas weigh about 1.5kg. There is lack of standardized unit of measurement in the local markets in the country.

1.1.1.4 Agricultural Financing in South Sudan

Given their small-scale and high risks, the farmers in the country are not able to access credit service to engage in gainful productive activities, value-addition and marketing. Most financial institutions in the country do not have loan products for small-scale farmers. The agricultural bank of South Sudan is currently not lending to farmers. A number of NGO-supported micro-finance organisations (e.g. Rural Finance Initiative – RUFi) lend to selected farmers via farmers' groups using group lending methodologies at an interest rate of 1.5 percent per month. Loan

categories under RUFIs include seasonal crop production loans, farm equipment acquisition loans, among others. Informal lending mechanisms such as the village saving and loan association (VSLAs) are also emerging in the country courtesy of catalytic action by NGOs.

1.2 World Vision's South Sudan FORSITE Project

Following the recent EU award, World Vision International (WVI) and its consortium partners; Norwegian Refugee Council (NRC) and AVSI will conduct an integrated market system and local value chain assessment in four priority counties in South Sudan, namely; Cueibet, Gogrial, Twic and Jur river. The assessment result will be a prelude to a 44-month project being funded by the European Union (EU) play a pivotal role as it will help in designing and fine-tuning forthcoming project activities in the priority counties. The project seeks to address several constraints related to resilience challenges in the Greater Bahr el Ghazal given the challenging institutional and policy context of South Sudan.

The proposed project activities are aligned with the Comprehensive Agricultural Development Master Plan (CAMP) of South Sudan which outlines the country's framework for agricultural development under four themes: Reconstruction and Recovery, Food and Nutrition Security, Economic Growth and Livelihood Security and Institutional Development. The project interventions contribute to the CAMP goals by supporting households (HH) in the project locations to recover from the shocks experienced due to violent conflict, improve their food production capacities and strengthen their livelihoods.

For the purpose of this assessment, under Gender-sensitive Local Value Chain Development (LVCD)/ Market Systems Development (MSD)¹. Market Systems Development component seeks to address the underlying causes of market dysfunction, so that markets operate more effectively, sustainably and beneficially for the poor, reducing poverty and generating widespread, sustainable change through expanded livelihood opportunities (also referred to as the Making Markets Work for the Poor (M4P).

Local Value Chain Development is a strategy within MSD, targeting to work directly with farmers/producers to increase their access to markets and value chains and increase their profitability. It will involve helping vulnerable producers and farmers to analyze markets, gain information, build relationships and act collectively to overcome market barriers and increase profits. To ensure women's equitably benefit, an emphasis on gender will be incorporated in the following key steps:

- Working with target community to scope the local economy, consider gendered roles and barriers to participation in production, and identify high-potential products in a participatory local value chain analysis;
- mobilizing and strengthening producer groups to work collectively to purchase inputs, process and market products;

¹ World Vision Australia. 2018. "Inclusive Market Systems Development." <https://www.worldvision.com.au/docs/default-source/publications/aid-trade-and-mdgs/wva--inclusive-market-systems-development-paper--final.pdf>.

- Linking producer groups to technical and business training and coaching to ensure they have the required knowledge, skills and behaviors to respond to market requirements;
- Supporting producer groups to access savings and finance, extension and business services and new and existing markets by linking them to market actors and service providers (again considering gendered barriers to accessing technical services and markets), ensuring long-term self-sufficiency.

1.2.1 Background of World Vision's FORESITE Project Locations

1.2.1.1 Background of Cueibet County

Cueibet county is located in the Lake State and has an area of about 4,866km² with a population density of 36.58 persons per km². The county borders Rumbek North County to the south. It also borders Warrap State to the east and Wulu County to the south (CSRF, 2020). From the county, the Bahr Gel River flows to the north. According to FEWSNET (2018) report as documented by CSRF (2020) report, the county lies juxtaposed between the iron plateau agro-pastoral and the Western floodplain sorghum and cattle. The main economic mainstay of the inhabitants in the county are cattle rearing and subsistence farming with maize, sorghum and local vegetables being grown by most inhabitants (CSRF, 2020; FAO, 2020). The coordinates for the county are: 7.02667° North, 29.2461° East. According to AVSI 2017 Conflict Mapping Survey report, majority of the population in the county has no schooling experience. Livestock rearing and agricultural production are the main economic activity. The population is estimated at 177, 987. Major challenges facing the county economic development are insecurity, cattle rustling, preponderance of pests and diseases, lack of water, conflict over grazing land and inaccessibility to livestock markets.

1.2.1.2 Background of Gogrial East County

Gogrial East County is situated near the border of Sudan and the Abyei region. It is approximately 700km by road from Juba. The county is located in Warrap State bordering Gogrial West County to the west, Twic County to the north-east and Tonj North County to the south-east. It also borders Unity State (Mayom County) to the north-east (CSRF, 2020). The county is situated within the western floodplains sorghum and cattle livelihoods (FEWSNET, 2018; CSRF, 2020). The coordinates of Gogrial are: 8°31'48" North, 28°6'0.00" East. The estimated population of the county is currently 126,978. It is composed of flat grasslands. Majority of the communities are agro-pastoralist, engaged in cattle rearing, subsistence farming and fishing (IOM, 2013). Planting is conducted during the rainy season and the main crops are maize, sorghum, millet, sesame and groundnut. Fishing is also being done in the county. Occasionally, livelihood activities are disrupted by seasonal disputes and cattle rustling and conflict over grazing land in 2016, Gogrial was categorized as being food insecure. The high water table and swampy conditions in the county provide ample pastures for cattle. Occasional annual flooding usually destroys crops and infrastructure. The Jur River passes through northern Gogrial from Gogrial West to Unity State.

1.2.1.3 Background of Twic County

Twic County is located in Warrap State and it borders Gogrial West County to the south-west and Gogrial East county to the south-east (CSRF, 2020). The coordinates for Twic County are: Latitude: 9.1106° or 9°6'38" North, 28°17'10.1" East. It is also located in close proximity with Aweil East county to the west, Abyei administrative area to the north and Unity State (Abiemnhom and Mayom Counties) to the east. The county has an area of 3,957km² and a population density of 73.58km². The estimated population is 262,546 (CSRF, 2020). According to FEWNET (2018) and CSRF (2020) report, the county is classified under the western floodplains sorghum and cattle livelihood zones. The main river flowing in the county is Wunrok River (also referred to as River Lol that flows from Gogrial West (CSRF, 2020). Flooding is major stumbling block negating logistic especially in the months of July-December when sometimes up to 70 percent of the county is flooded. According to FAO and WFP (2018) as reported by CSRF (2020), the main economic activities of over 55 percent of the inhabitants is derived from subsistence agriculture. Other activities are local cattle rearing where cattle are used as a form of currency, fishing and small-scale trading.

1.2.1.4 Background of Jur River County

Jur River County is situated in the eastern and northern part of Western Bahr el Ghazal State. The county is composed of six payams, namely; Kangi, Udici, Marial, Wan-bai, Rojrojdong and Kuajina. The county headquarter is located in Nyin Akok on the Eastern bank of Jur River. The population of the county is 198,320 people. The coordinates for Jur River County are: 7.9404° North, 28.03041° East. The county borders Wau County to the west, Northern Bahr-el-Ghazal State to the north-west, Warrap State to the east and Western Equatoria State to the south (CSRF, 2020). According to FEWSNET (2018) report, the county is situated within the ironstone plateau agro-pastoral livelihoods zone. The county has a wide diversity of natural resources that enable inhabitants to practice different livelihood activities such as agriculture, cattle-rearing and fishing. As at 2017, 75 percent of the dwellers in the county were engaged in agricultural production (FAO, WFP, 2018). Major agricultural commodities are groundnut, sorghum and maize and to a limited extent sesame. Additionally, vegetable crops are also grown in the county. The local markets are also supplied with agricultural commodities from supply markets such as Wau and Tonj (CSRF, 2020).

Objective of World Vision's FORESITE Project:

The overall objective of World Vision's FORESITE project is to contribute to strengthening resilience of communities, improving governance and conflict prevention and reduced forced displacements due to loss of livelihoods. The specific objective is to improve "food security of rural smallholders in Greater Bahr el Ghazal and to empower them to cope with environmental volatility and insecurity". This will be achieved through an integrated, gender-sensitive approach to three complementary expected results (ERs), namely:

Outcome 1: Reduced barriers to engagement in resilience building, food security and income generating activities, especially for women and youth;

Outcome 2: Increased anticipatory, absorptive, and adaptive capacity with respect to climate change and disruptive events including natural disasters and conflict; and

Outcome 3: Improved longer-term food security and income especially for women and youth.

1.2.2. Market Systems and Local Value Chain Purpose and Objectives

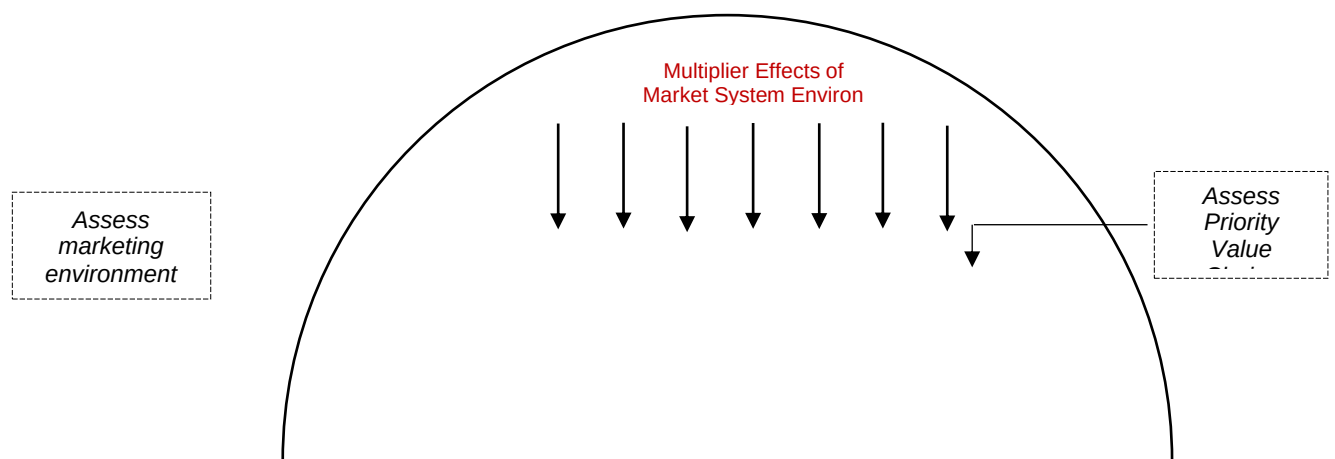
The purpose and objectives of this assessment was to document the current state of market systems and value chains in participating payams across former Warrap, Lakes, and Western Bahr el Ghazal States, including the way value chains in these target payams extend through the farming communities {crop+ livestock} and into local and regional towns.

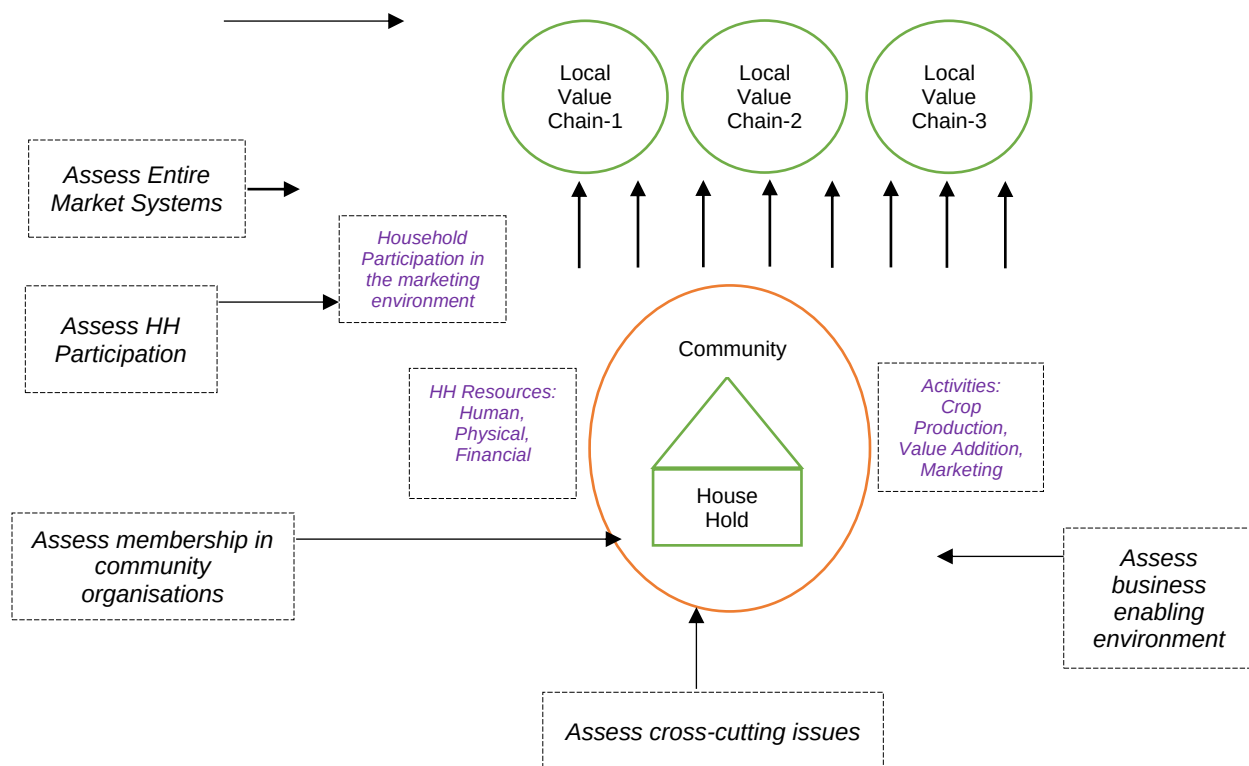
The consultant achieved the following objectives:

- 1) Mapped out key market actors along the key value chains such as sorghum, sesame, groundnut, millet, and a range of vegetables (onions, garlic, tomatoes, cabbage, orange-fleshed sweet potatoes and other tubers);
- 2) Mapped out key market actors along the key livestock value chains [ox, cow, shoats, chicken etc..] in the project areas;
- 3) Assessed the incipient markets actors including a reviewing organizational characteristics, identifying those supporting and those hindering their market-oriented development;
- 4) Analyzed the market systems, constraints and opportunities to unlock potential identified, viability and sustainability issues interrogated;
- 5) Identified potential economic opportunities and value addition opportunities that could be undertaken by targeted smallholder producer(s) in the project locations;
- 6) Assessed the existing informal and formal relationships and governance mechanisms among actors along the value chains;
- 7) Analysed potential risks likely to impede market development in the operational context; with recommendations on how to mitigate against the risks outlined.
- 8) Drew out recommendations for partners, business models and intervention strategies

1.3 Market Systems and Local Value Chain Conceptual Framework

Conceptual Framework for Market Systems and Local Value Chain Assessment:





Assessment of the entire market system involved assessment of the sampled households' agricultural and marketing activities, assessment of the community business enabling environment, rules and regulations, norms and cultural aspects, assessment of the respective local value chains at the payam levels, assessment of agribusiness actors including processors, wholesalers and retailers, BDS providers and other actors operating within the environment

SECTION TWO: ASSESSMENT METHODOLOGY AND APPROACH

2.1 Assessment Design

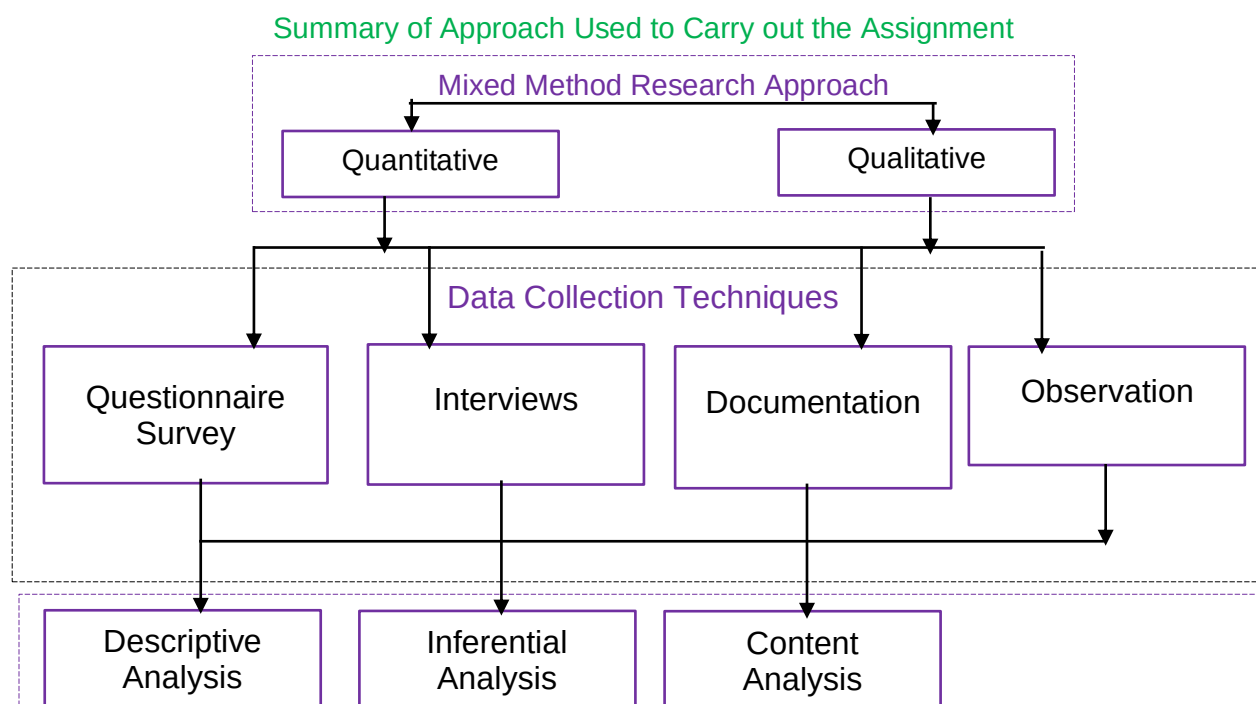
The following is an outline of how the assessment took place in the respective payams of the Cueibet, Gogrial East, Jur River and Twic Counties. It includes a description of how data was collected, the used to collect the data and how the data was analyzed.

2.1.2 Assessment Philosophy

Given the nature of the assessment that entailed collecting and analyzing data on market systems and local value chains, the consultant used both quantitative and qualitative data collection methods as an approach in conducting the assessment. This assessment was grounded by positivism (quantitative) and post-positivism (qualitative) research philosophy. Quantitative method was used to collect quantitative data while qualitative method was used to collect generate and analyze non-numerical data.

2.1.3 Assessment Strategy

This assessment used survey strategy to collect quantitative and qualitative data. Further, Focus Group Discussion (FGD) and interviews of key informants (governmental workers, NGO staff, chamber of commerce and agriculture) was also conducted. The consultant used cross-sectional study to conduct the assessment given the time-constraint.



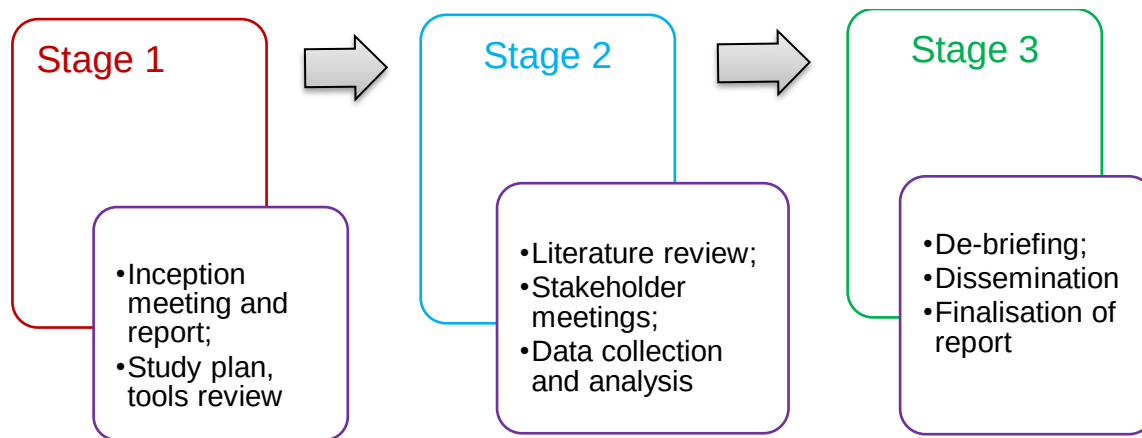
Source: Consultant's Conceptualization (August 2020)

2.2 Assessment Process

Agricultural and livestock Producers

The Consultant adopted a participatory approach in managing the assessment to ensure the stakeholders' participation during the research. This led to the collection of relevant information including diagnosis of the market systems environment, social and institutional constraints affecting the FORESITE project. The assessment followed three stages as shown below.

Fig 2.2: Study Methodology



2.2.1 Data Sources

The approach to primary data collection was participatory, involving working closely with stakeholders to gather the relevant data and to form and validate crucial information as they become apparent. The survey was based on triangulation of several sources of information including questionnaire enumeration and key informant interviews (with key stakeholders in the county including farmers' representatives, government extension staff, private sector industry players, Key informants and non-governmental organisations). This approach ensured accuracy and reliability of data collected. Additionally, relevant literature and secondary data was also reviewed and analysed through desk-top research and review of existing project reports and reports of other development actors in the FORESITE project locations.

2.3 Sample Size and Sampling Design

In this research, a multi-stage sampling method was adopted. A stratified sample of farmers, agro-pastoralists, traders, processors, wholesalers, retailers, governmental and non-governmental and key informant persons were selected in the study.

Appropriate sample size will be calculated as follows according to Bartlett *et al.* (2001):

$$n_o = \frac{(t)^2 * (p)(q)}{(d)^2} \dots\dots\dots (1)$$

$$n_o = \frac{(1.96)^2 * (0.5)(0.5)}{(0.05)^2} = 384$$

Where; t = value for selected alpha level of 0.025 in each tail = 1.96; $(p)(q)$ = estimate of variance = 0.25; d = acceptable margin of error for proportion being estimated = 0.05.

Thus, quantitative sample size was determined using proportionate to size method as follows:

	County	Sampling Frame (Estimated Population)	Percentage (%)	Sample Size	Actuals
1	Cueibet	177,987	23.24%	89	105
2	Gogrial	126,978	16.59%	64	77
3	Twic	262,546	34.28%	132	138
4	Jur River	198,320	25.89%	99	90
	Total	765,831	100%	384	410

2.4 Assessment Process for Market Systems

The consultant carried out analyses of challenges and opportunities in Cueibet, Gogrial East, Jur River and Twic Counties; the analysis process was done as follows:

2.4.1 Carried out detailed assessment of state of the market in the Cueibet, Gogrial East, Jur River and Twic Counties covering:

- State of the market infrastructure (state of the roads and distance to the markets, mobile telephone networks, market facilities: stalls, display table, sanitary conditions;
- Organisation of the market (organisations of the main markets in to commodity traders, wholesalers, retailers, petty commodity traders), and constellation of market actors;
- Market taxes and fees levied on agricultural commodity traders and licenses;
- Market controllers/ gate-keepers (councils) operating in the market;
- Assessed financial service providers; and criteria for accessing finance;
- Rules and regulations existing in the markets in the priority locations
- Identified systemic specific challenges and opportunities; existing challenges and opportunities in the marketing environment; identified cause of market failures and successes in the market;
- Profiled market opportunities that are scalable and able to create systemic changes in the marketing environment;
- Identified areas for MSME entrepreneurial development growth in the markets;

- Identified potential local partners/ institutions/ MSME businesses that could be supported to upscale business activities and tap into the existing opportunities;
- Suggested solution to improve the business enabling environment in the respective markets; recommended viable solutions to deal with market failures;
- Recommended incentives (financial and non-financial) that could be provided to support the market chain actors;

Further, the consultant carried out the following activities:

- Scoping: selected sub-sectors with potential for change;
 - The consultant assessed potential crop and livestock sub-sectors in the project location; this included other cross-cutting sectoral units including seed system and financial services;
- In-depth analyses of selected sub-sectors;
 - To understand how the sub-sectors work, the consultant assessed constraints, perceptions, facts and figures, actors, volumes and values attached to each nodule of the potential sub-sectors and trends; Identified opportunities existing in the sub-sectors, competitive advantage, where investment should take place, demand-supply gaps, sub-sectors with productivity and value loss, sub-sectors with persistent strong demand and high margins;
- Developing strategies for the selected sub-sectors;
 - Worked out strategies to upscale productivity, market participation and income growth in the selected sub-sectors, strategies for synergies between existing actors, required resources (both financial and non-financial); and
- Explore possible sustainable interventions and potential local partners;
 - Recommended reasonable number of interventions to turn the sub-sectors into viable enterprises;
- Developed sector maps to guide the analyses; mapping was done to assist in understanding the sub-sectors, identify market segments, identify product channels and flows, identify trends (dynamics)

SECTION THREE: FINDINGS OF THE ASSESSMENT

3.1 Socio-Economic Context

3.1.1 Cueibet County and Payams Assessment Results

Socio-Demographic Characteristics:

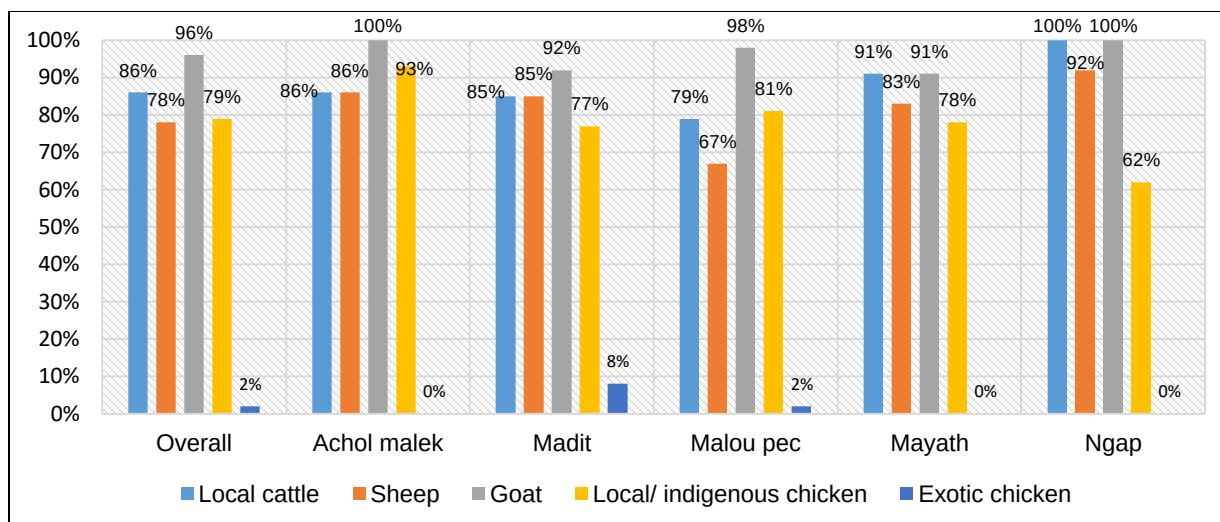
The table below shows the socio-demographic characteristics of the sample of this survey obtained from five (5) payams (Achol Malek, Madit, Malou Pec, Mayath and Ngap) of Cueibet County. From the table most (57%) respondents were female, most are married, do not have

formal education, are age between 18 and 35 years and are household heads. The average household size in the county was 10 members.

		Overall	Achol Malek	Madit	Malou Pec	Mayath	Ngap
Gender	Male	43%	64%	15%	40%	57%	31%
	Female	57%	36%	85%	60%	43%	69%
Marital status	Married	98%	100%	100%	95%	100%	100%
	Not Married	2%	0%	0%	5%	0%	0%
Age (Years)	18-35	52%	50%	46%	55%	57%	46%
	36-45	29%	14%	23%	36%	30%	23%
	46-60	16%	36%	15%	10%	13%	23%
	61 and above	3%	0%	15%	0%	0%	8%
Average Household Size		10	10	8	11	9	9
Gender of household members	Male	5	5	5	6	5	5
	Female	5	5	3	5	4	4
Household Headship	Head of household	71%	93%	69%	52%	87%	85%
	Non household head	29%	7%	31%	48%	13%	15%
What is the highest level of your formal education	Not educated	73%	86%	69%	69%	74%	77%
	Primary school	13%	7%	15%	17%	9%	15%
	Secondary school	9%	7%	8%	10%	9%	8%
	College Diploma/ Degree	5%	0%	8%	5%	9%	0%

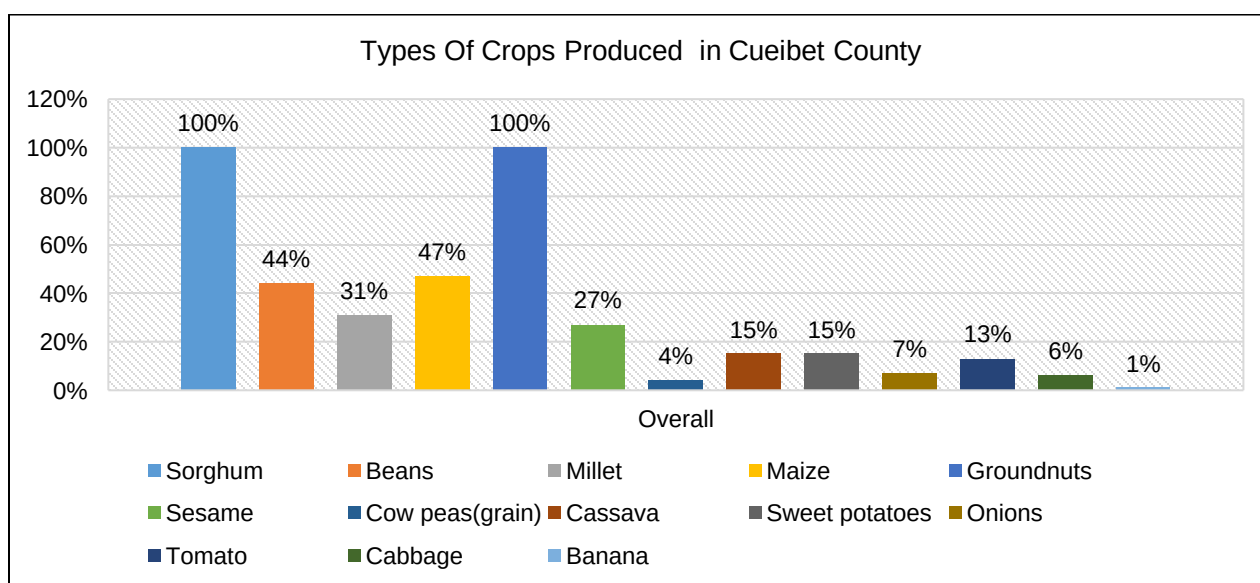
Livestock production

The main livestock reared in Cueibet County are goats (reared by 96% of respondents), local cattle (reared by 86% of all respondents), indigenous chicken (reared by 79% of all respondents) and sheep (reared by 78% of all respondents). This trend was similar across all the payams. Exotic chicken were the least produced livestock and were only reared in Madit and Malou Pec Payams.

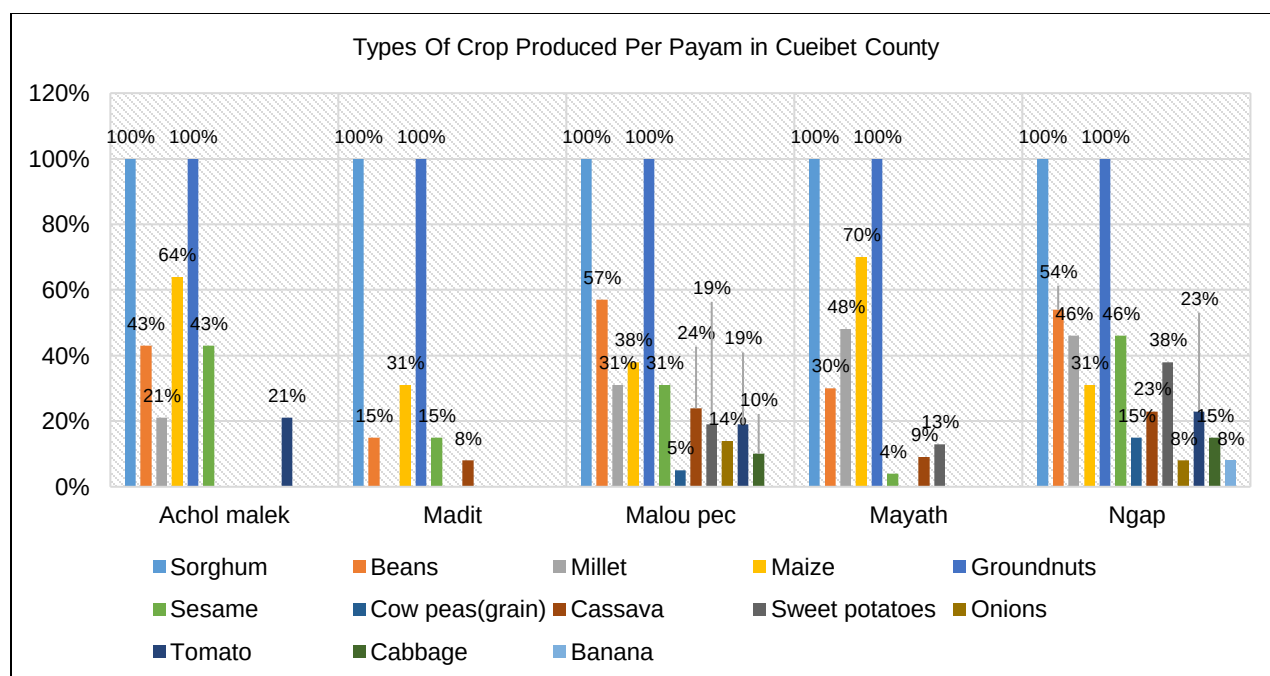


Crop Production

Overall, all farmers produced sorghum and groundnuts across Cueibet County. Maize was the third most produced crop in Achol Malek, Madit and Mayath payams while beans were third most produced crops in Ngap and Malou Pec. Millet was produced in all the Payams surveyed except Madit. Other crops produced included cassava, sesame, sweet potatoes, onions, banana, cabbage and tomatoes as shown in the chart below. This trend was similar for both male and female farmers.

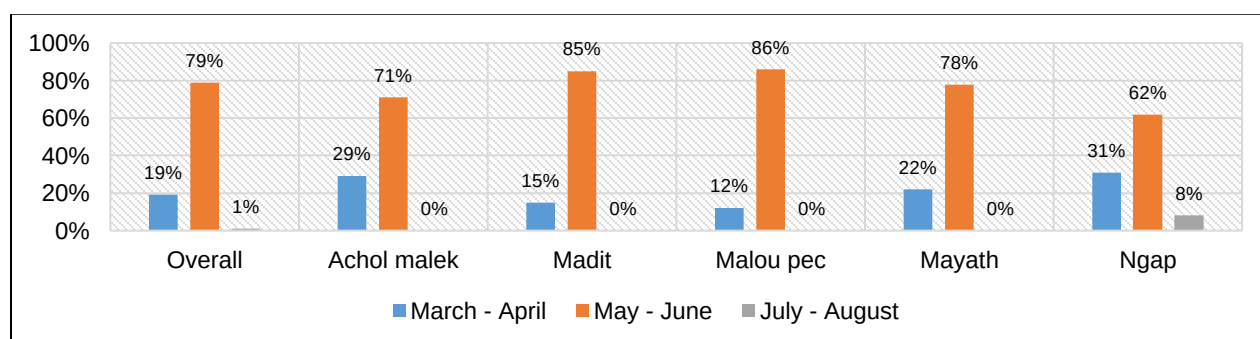


The chart below shows types of crops produced per payam in Cueibet County.



Crop Planting Seasons

Cueibet County had two main crop planting seasons; May to June and March to April. Most farmers planted crops in the May to June season while planting in the July-August season was only done in Ngap Payam and by only 8% of the farmers in the Payam. The Chart below shows crop planting seasons in the county.



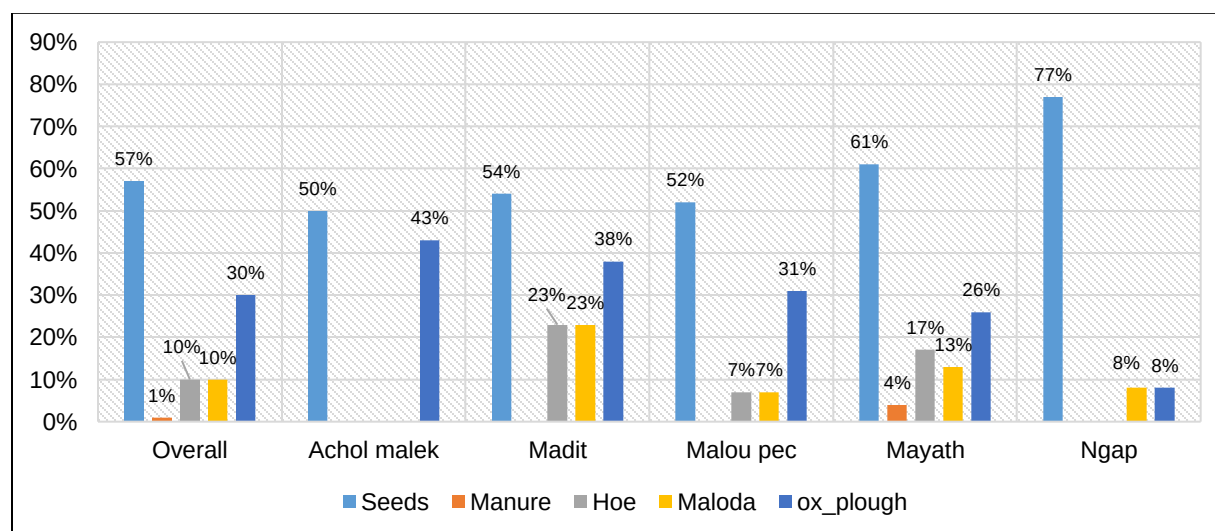
Size of Land Cultivated

Overall, farmers in the county planted an average of 4.3 feddans in a year. Farmers in Mayath payam planted more feddans compared to other payams while those in Malou Pec planted the least. Male farmers planted 1 more feddan than female farmers.

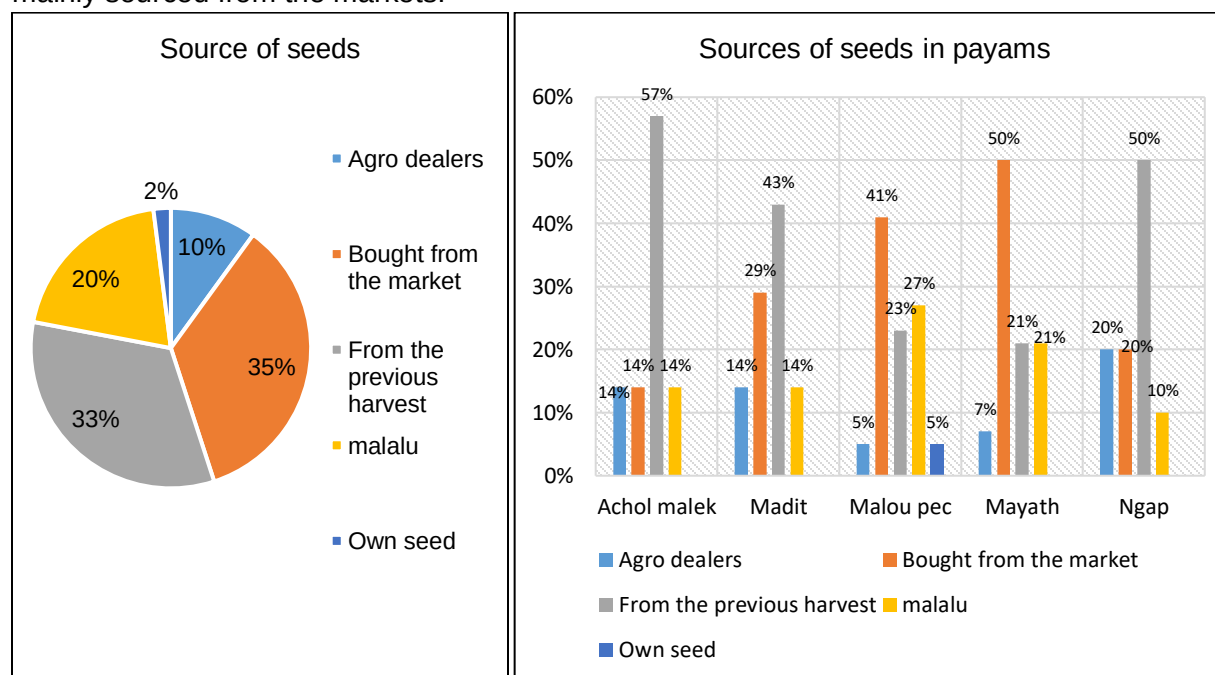
	Overall	Achol Malek	Madit	Malou Pec	Mayath	Ngap	Male	Female
Average size of land planted in a year (Feddans)	4.3	3.8	4.1	3	7.2	4.1	4.9	3.9

Farm Inputs Used by Farmers

The main inputs used by farmers in the county were seeds (57%) and ox-ploughs (30%). These are used in all the payams. Manure is only used in Mayath Payam and only by 4% of the farmers in the Payam. The manure was made from farmers' own cattle. Hoes are used by 10% of the farmers and these farmers used about 4 hoes per feddan. These hoes were sourced from the market. Malodas are also used by 10% of the farmers in the county. Farmers used an average of 3 malodas/feddan and 90% sourced them from the market and 10% from agro-vets.

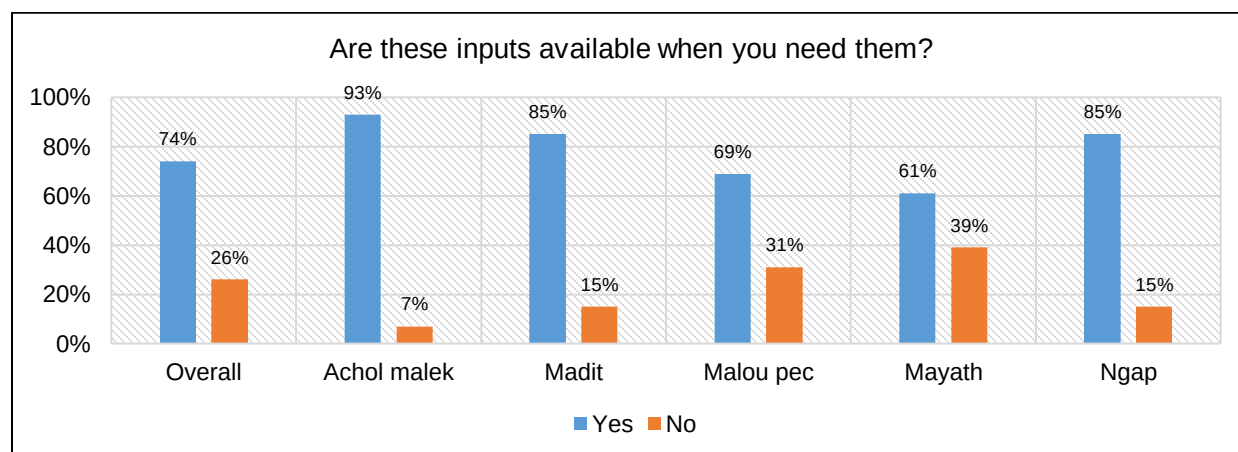


Overall, most of the farmers used 2 kilograms of seeds per feddan. The main source of seeds in the county was the market and seed from previous harvest. Farmers in Madit and Ngap payams mainly relied on seeds from previous harvests while those in Malou pec and Mayath payams mainly sourced from the markets.



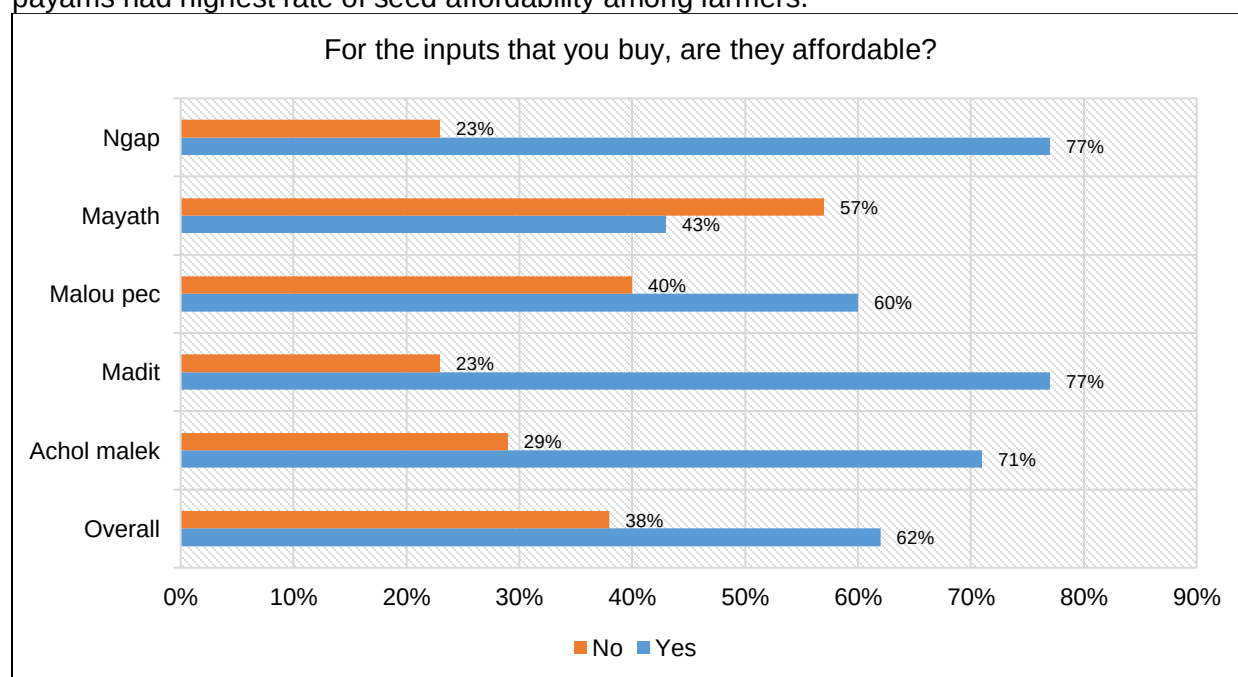
Inputs availability

Overall, the main sources of farm inputs in the county were the market, previous (seeds) and from agro-dealers. These inputs were readily available to 74% of the farmers. Achol Malek payam had the highest rate of input availability to farmers while Mayath payam had the lowest.



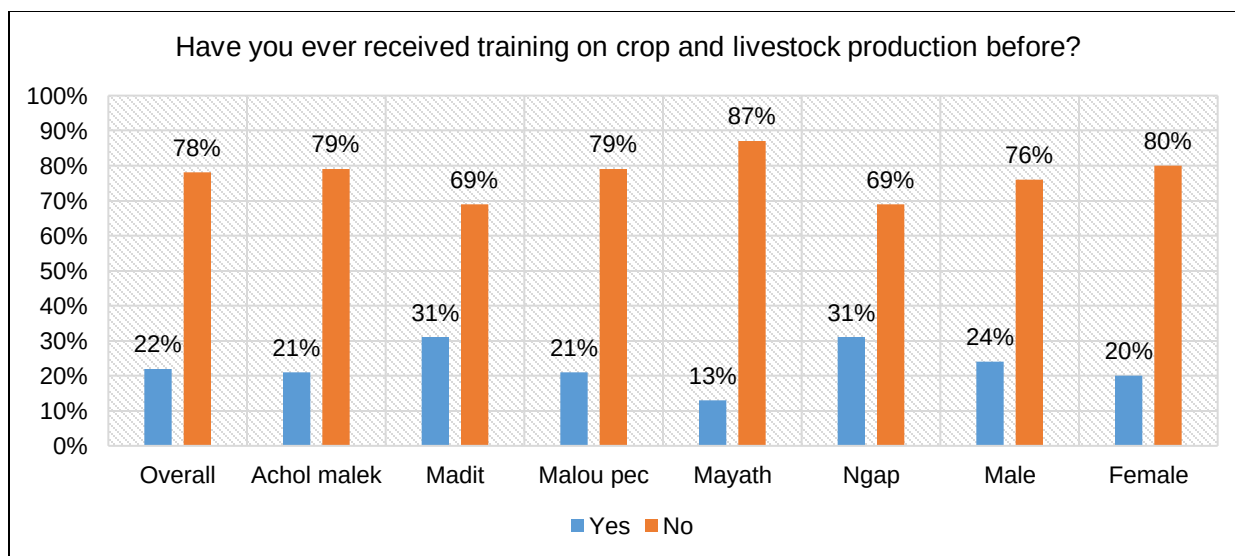
Input affordability

Inputs were affordable to 62% of farmers in the county. Inputs were affordable to most farmers in the county with the exception to most farmers (57%) in Mayath Payam. Ngap and Madit payams had highest rate of seed affordability among farmers.

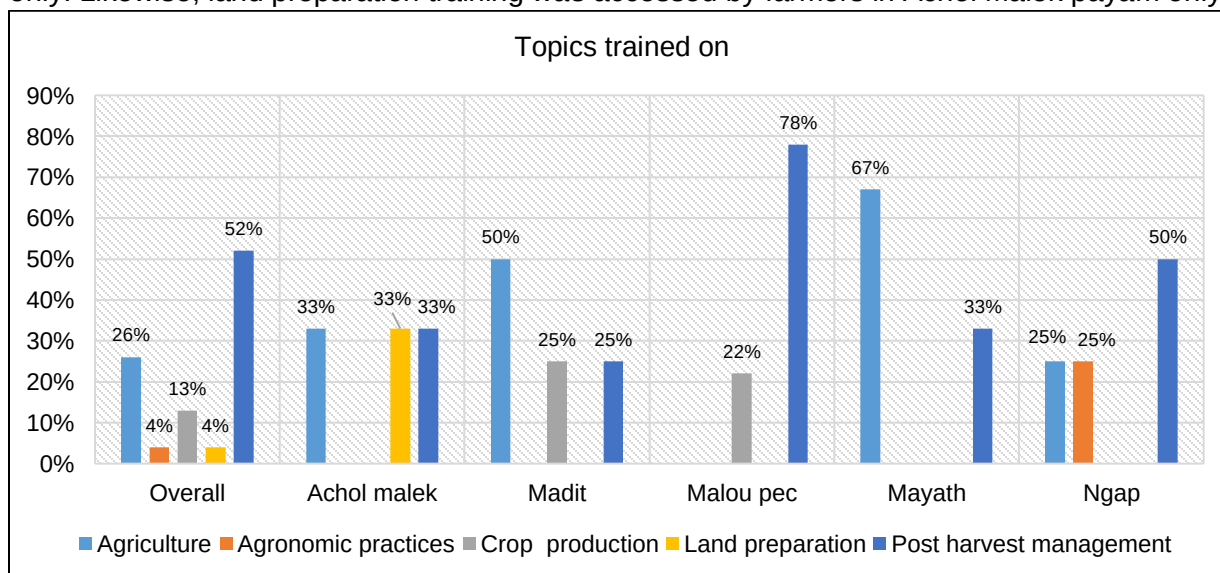


Training on Crop Production/ Livestock Production

Overall, only 22% of farmers in the county had been trained on crop production or livestock production. Slightly more male farmers had been trained compared to female farmers. In terms of payams, Ngap and Madit had more trained farmers compared to Mayath which had the least trained farmers as shown below.

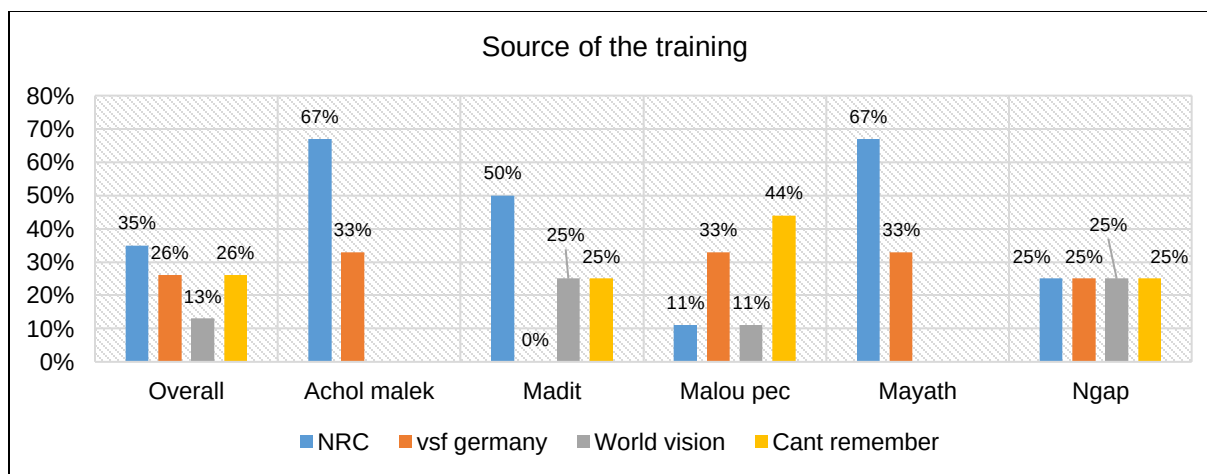


Out of those who were trained, most (52%) were trained on post-harvest management and 26% trained on agriculture. Crop production training was only accessed by farmers in Madit and Malou pec payams while agronomic practices training was accessed by farmers in Ngap payam only. Likewise, land preparation training was accessed by farmers in Achol Malek payam only.



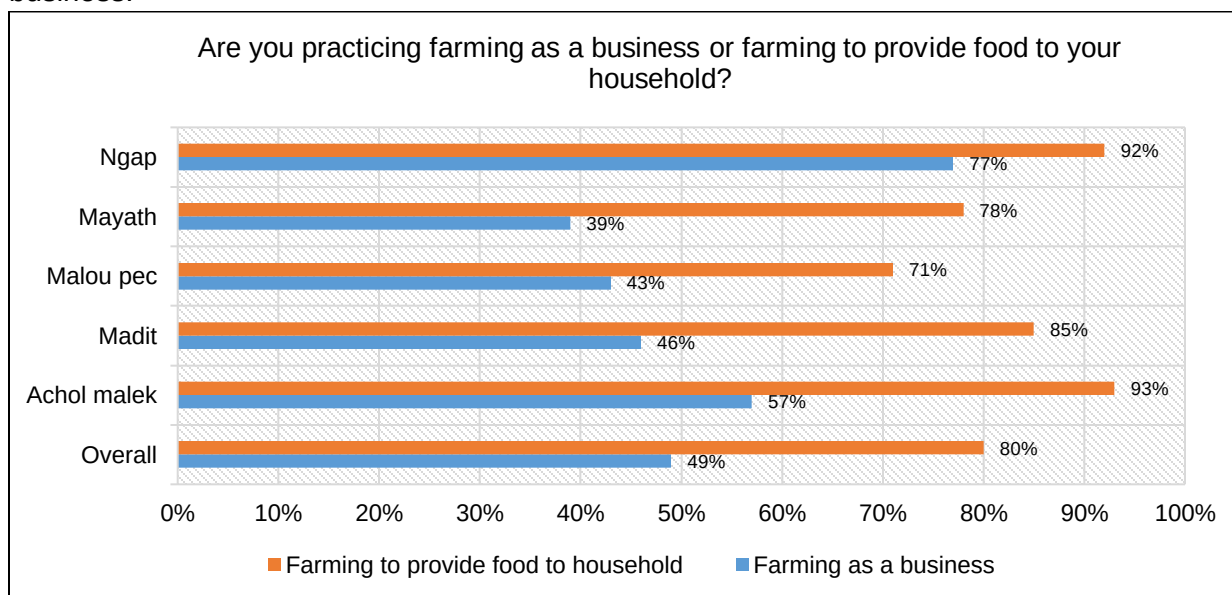
Source of training

Most (35%) of the farmers received training from NRC, followed by VSF Germany (26%). Overall, 13% were trained by World Vision. World vision trained farmers from Madit, Malou Pec and Ngap. The trainings were undertaken in an average of 4 days.



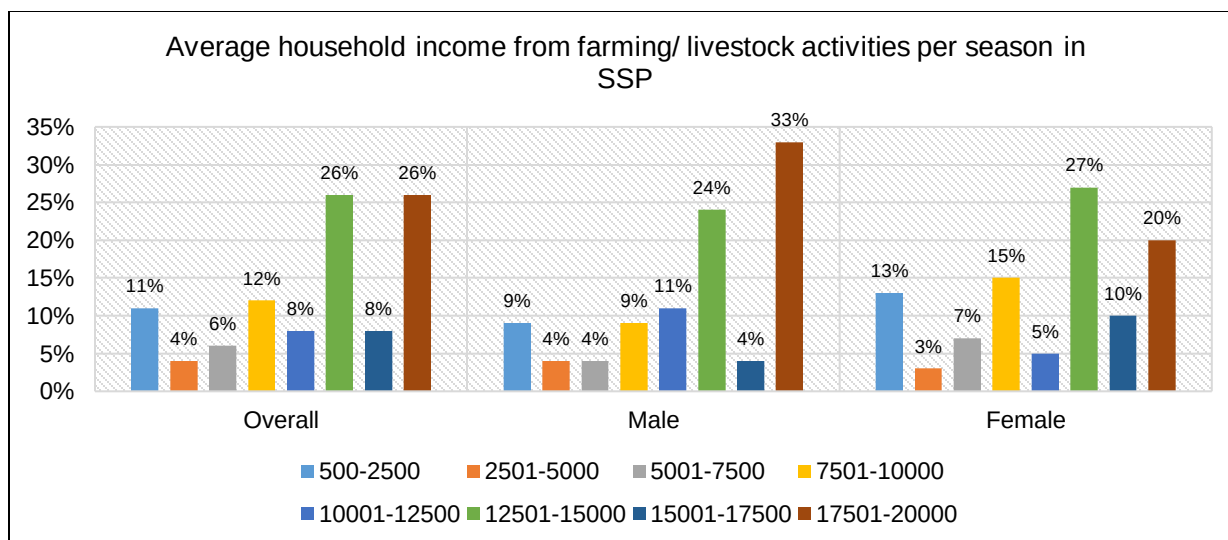
Farming and Business

Overall, 80% of the respondents in the county farmed to provide food for their household and 49% farmed as a business. Farming as a business was mainly done to generate income while farming for food was due to food insecurity. Low yields also hindered the uptake of farming as a business.

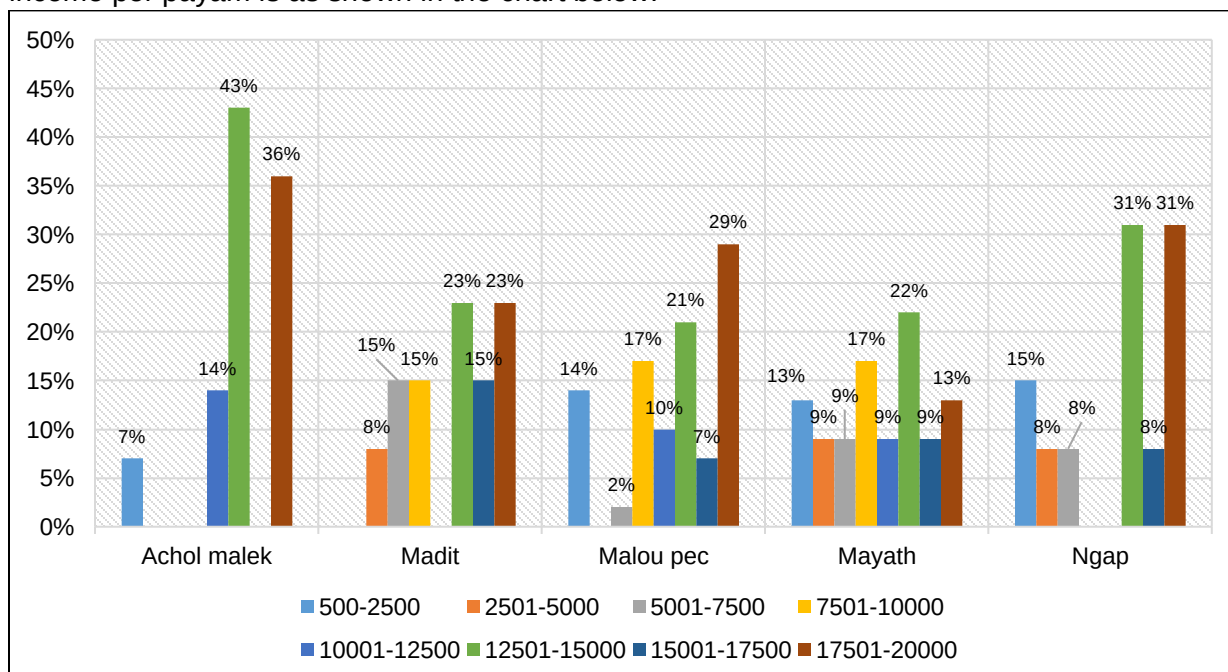


Household Income

Household income from crop farming and livestock activities per season for most farmers in the county (26%) earned between SSP 17,501 and SSP 20,000 followed by 26% who earned between SSP 12,501 and SSP 15,000. Most of the male farmers (33%) earned SSP 17,501 and SSP 20,000 while most female farmers (27%) earned between SSP 12,501 and SSP 15,000.

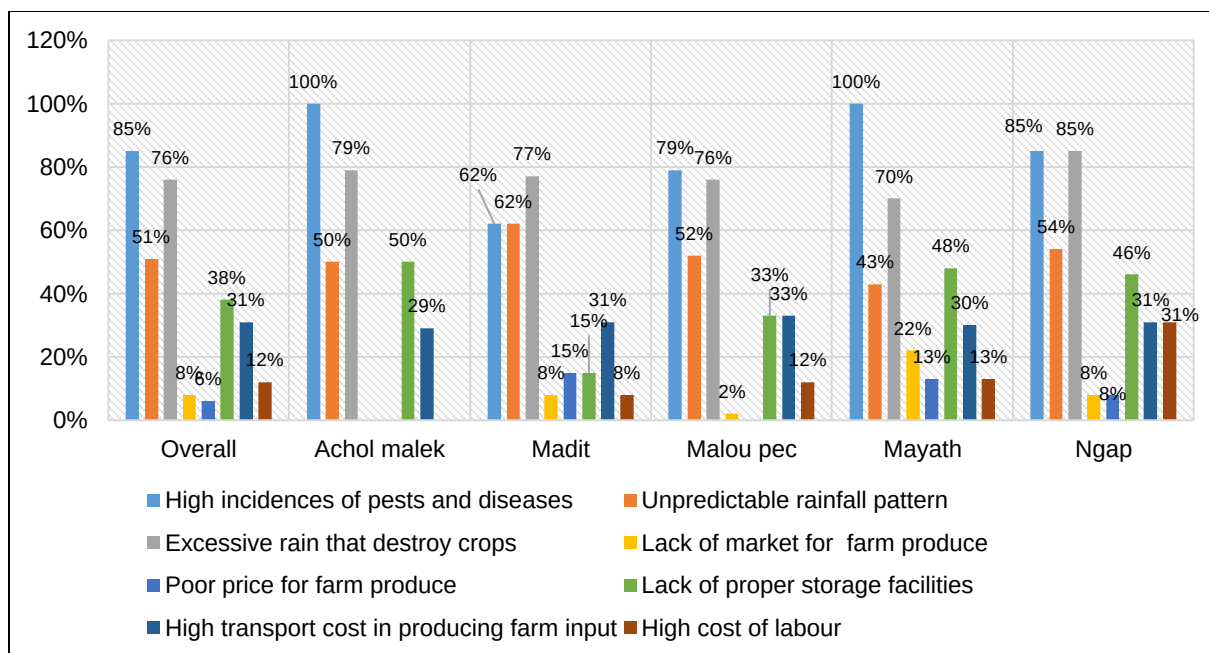


Household income was highest in Achol Malek payam and least in Mayath payam. Household income per payam is as shown in the chart below.

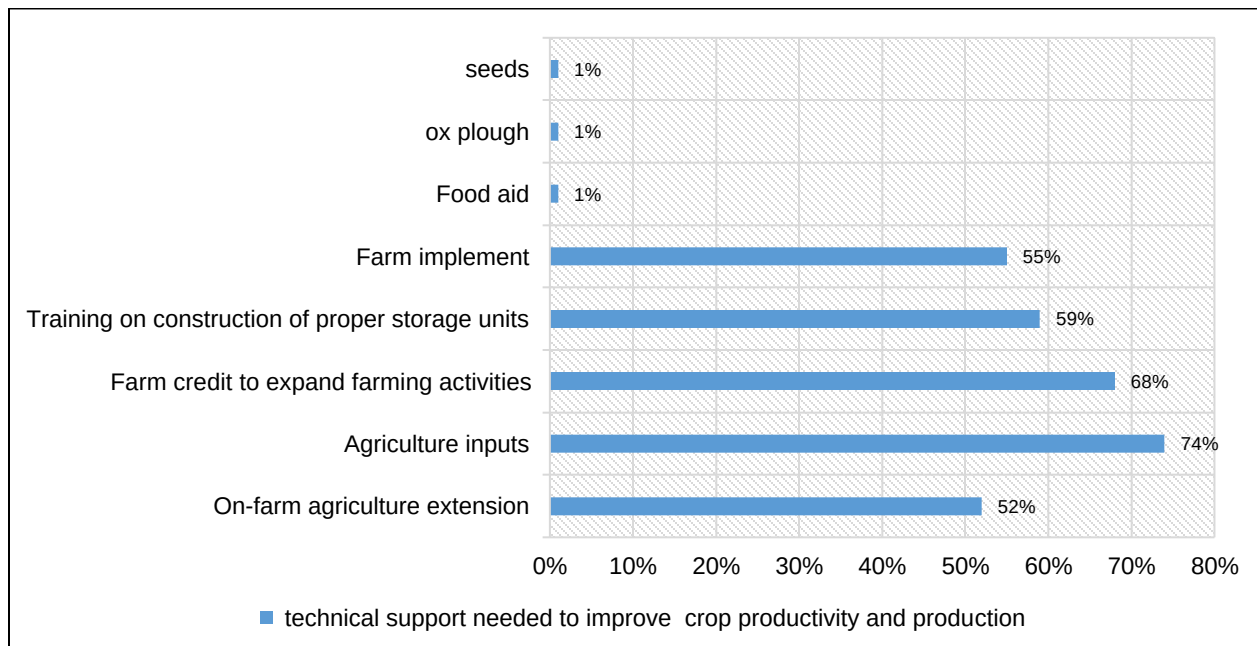


Challenges Faced by Farmers in Crop Production

The main challenge faced by crop farmers in the county included high incidences of pests and diseases (85%), excessive rain that destroyed crops (76%) and unpredictable rainfall (51%) among others as shown below. This trend was cross cutting across the payams.



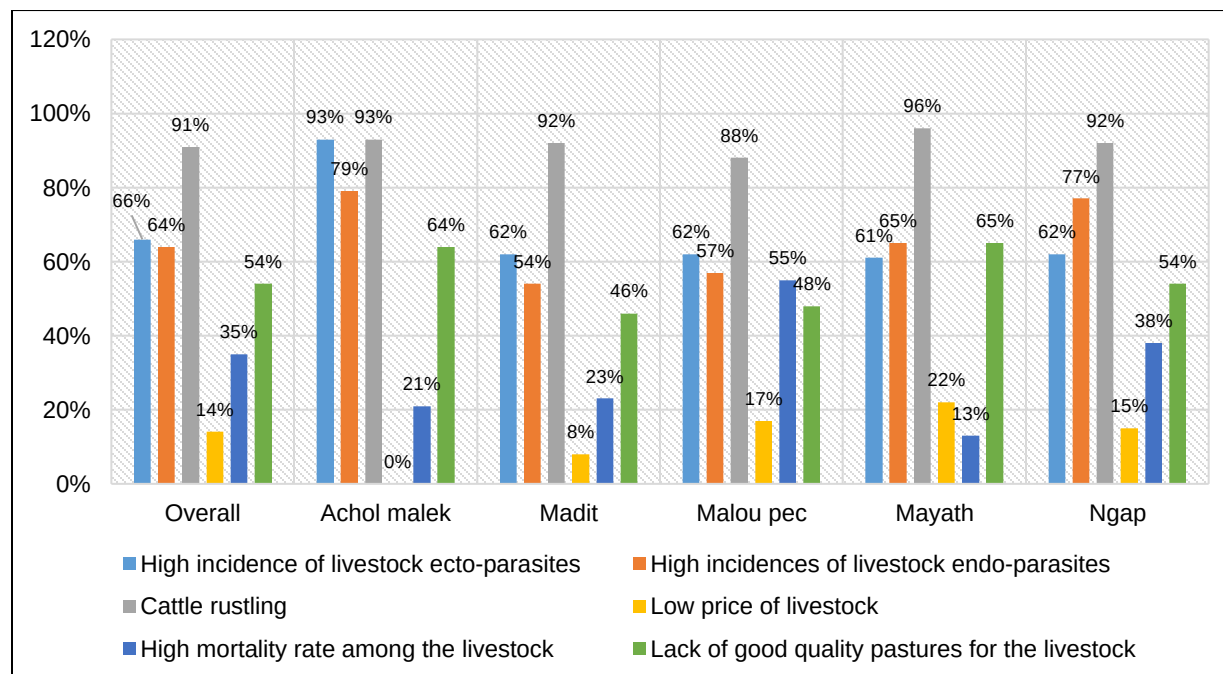
From the challenges identified above, farmers in the county cited the following needs in form of technical support as necessary to improve productivity and production. Agricultural inputs support was most required by 74% of the respondents, 68% required farm credit to expand their farming activities among other key needs as shown in the chart below.



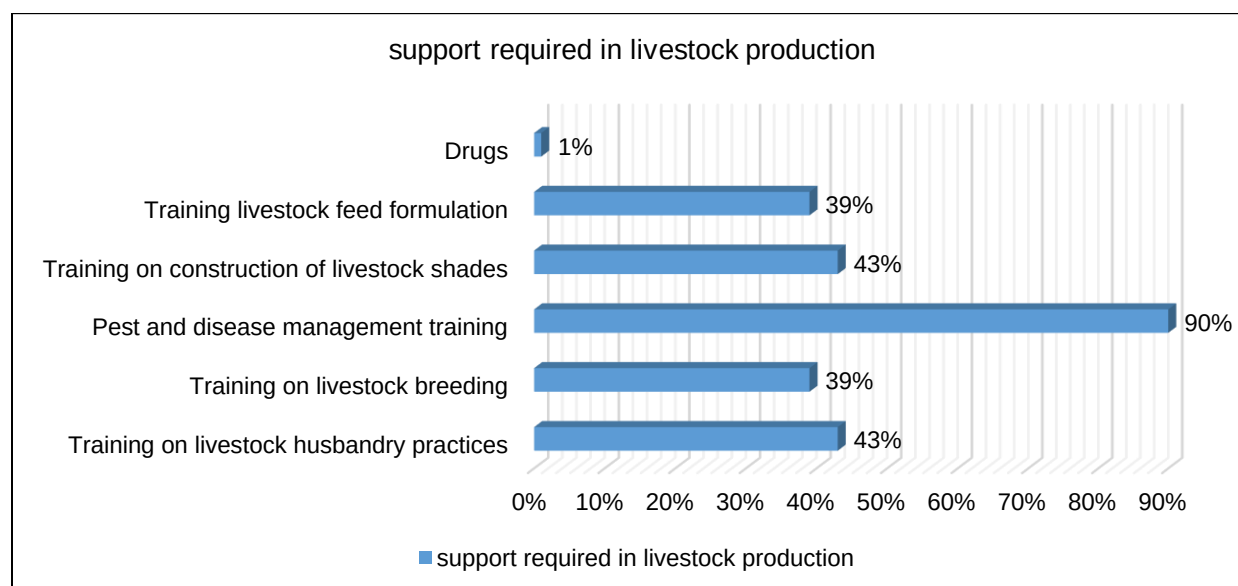
Challenges in Livestock Production

The main challenge in livestock production in the county include cattle rustling which was expressed by 91% of the respondents and by respondents across all payams. Other challenges

include ecto and endo parasites, lack of good pastures, high mortality rates of livestock and low prices of livestock as shown in the chart below.

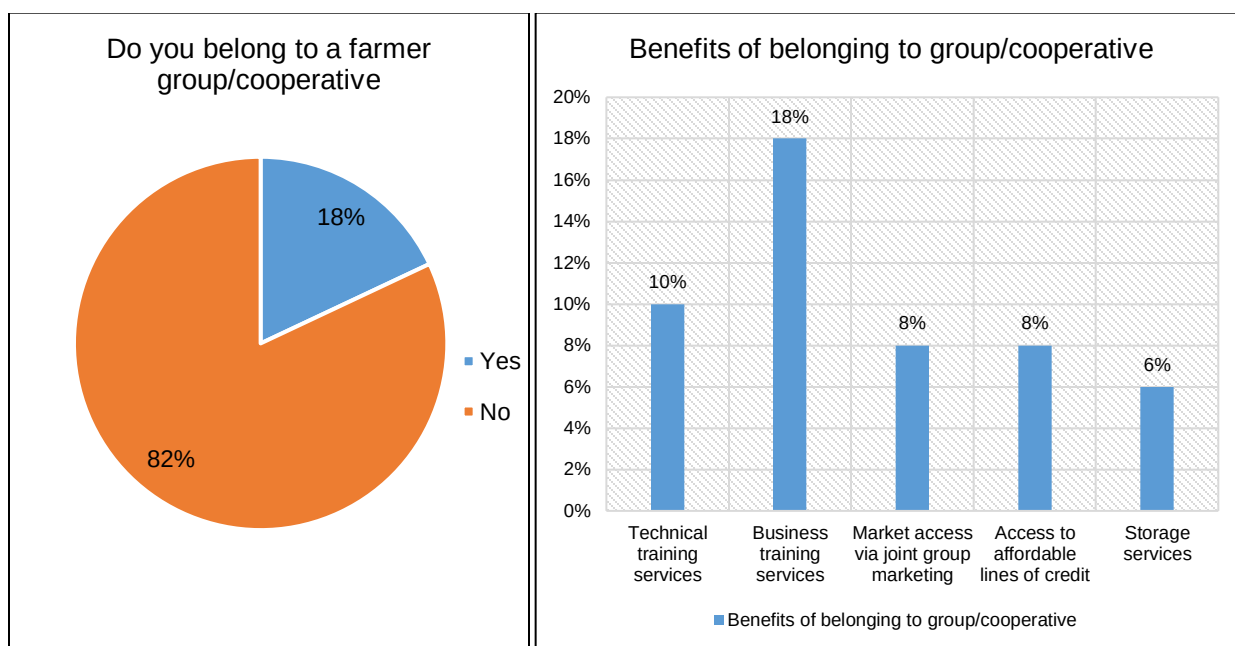


From the challenges, the farmers required support in form of pest and disease management (90%), training on livestock husbandry practices, livestock breeding feed formulation and construction of livestock shades as shown in the chart below.



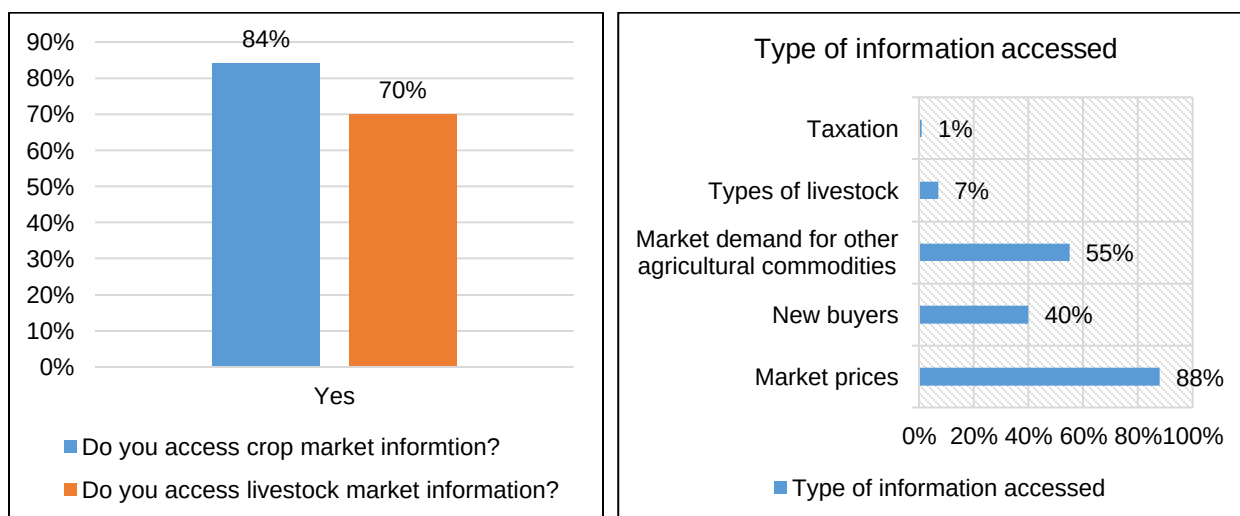
Farmer Group/ Cooperative Membership

Membership to cooperatives and farmer groups was low as only 18% of the respondents in this county belonged to groups. Out of the 18% who belonged to groups/ cooperatives, they benefitted in business training, technical trainings market access, credit and storage services.



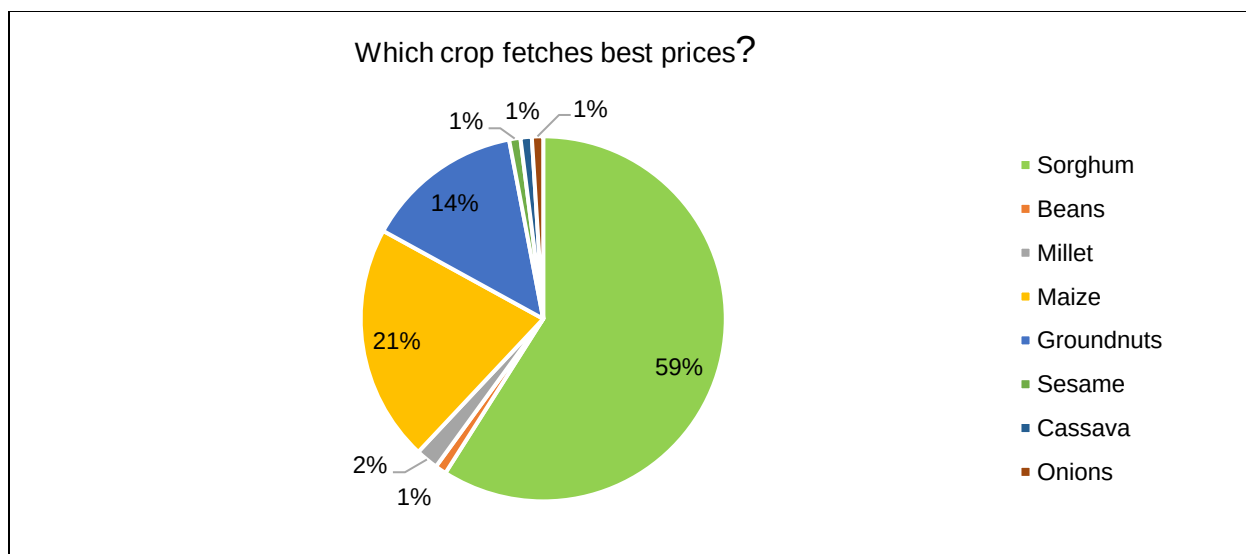
Access to Market Information

Overall, 84% of farmers in the county had access to crop market information and 70% accessed livestock market information. The main type of information accessed is market prices, market demand, new buyers, types of livestock and tax information as shown below.



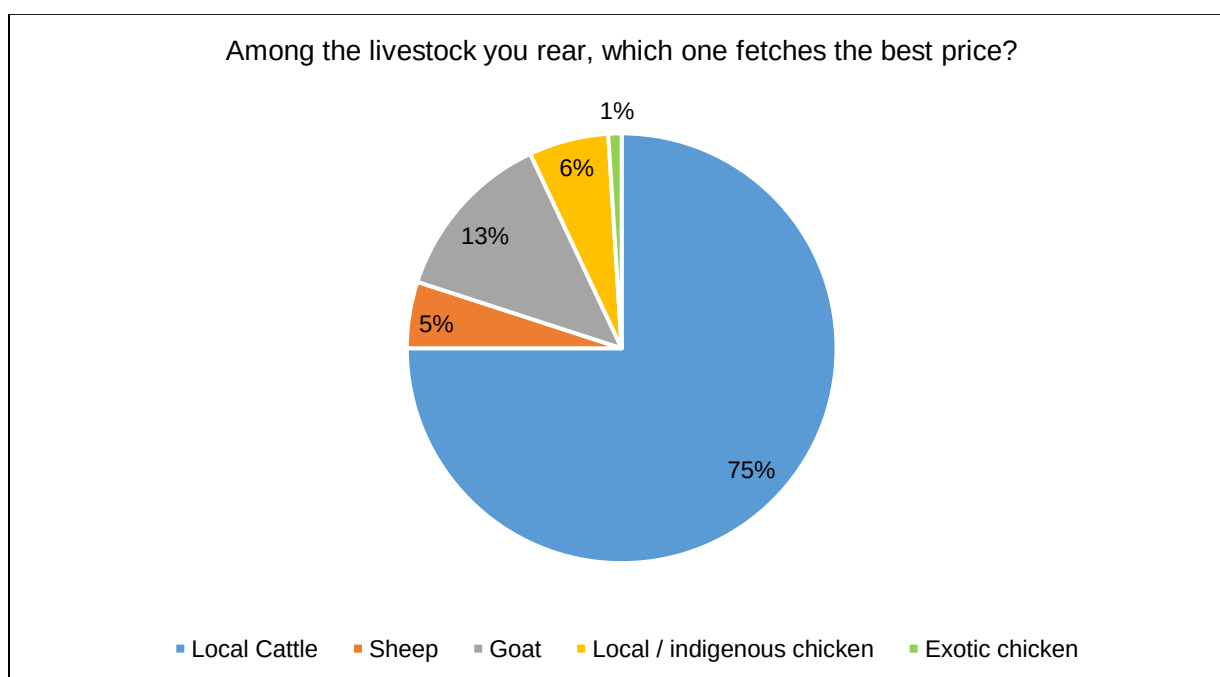
Crops and Market Prices Fetched

Among the crops farmed in the county, groundnut, sorghum and maize fetch the best prices in the market. On average, most farmers fetched SSP 75 per kg of sorghum, SSP 42 per kg of Maize and SSP 166 per kg bag of groundnuts.



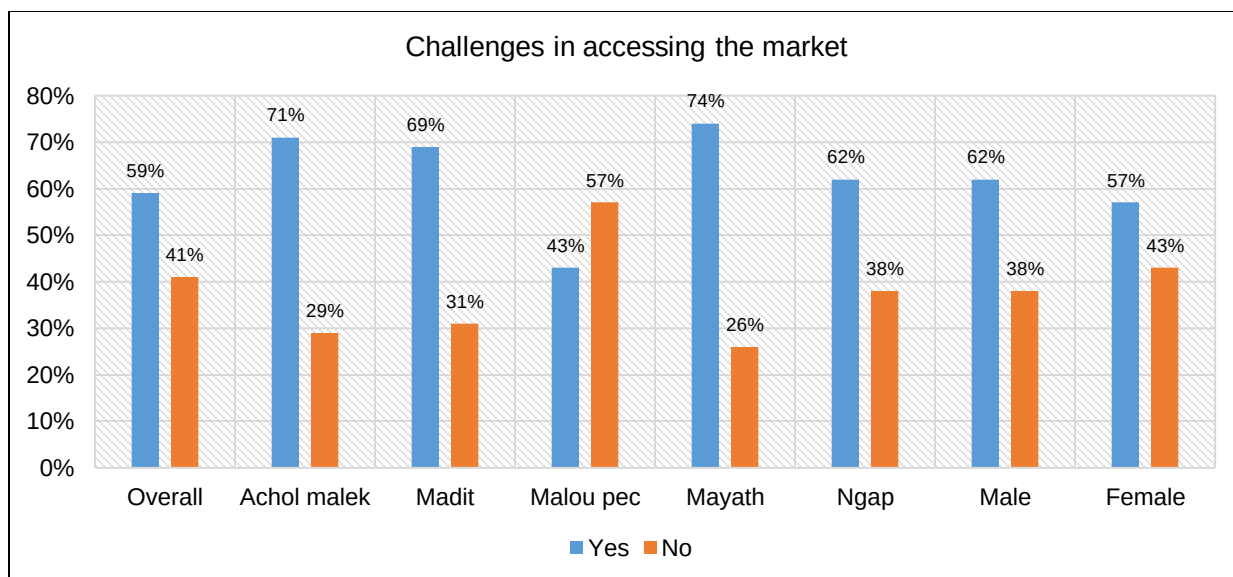
Livestock and Market Prices

Most farmers (75%) cited local cattle as the livestock that fetched best prices in the markets followed by goat, indigenous chicken and sheep. On average, most farmers in the county fetched SSP 50,000 per cattle, SSP SS 6,250 per sheep, SSP 14,000 per goat.

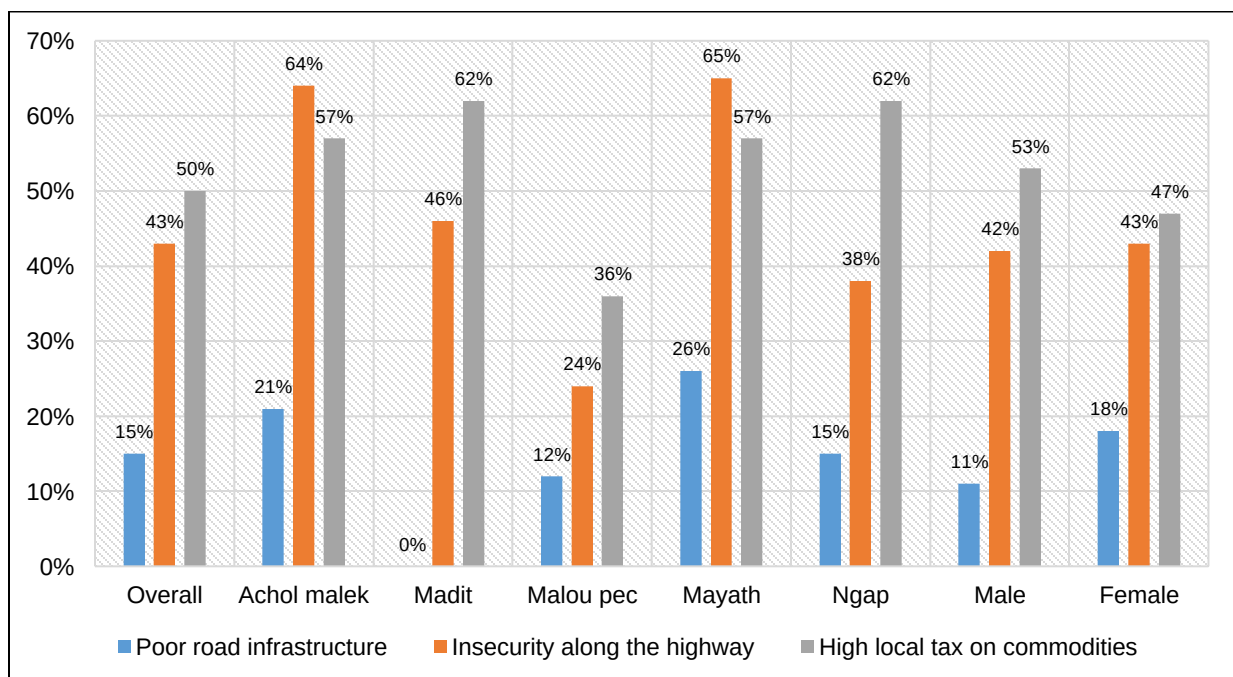


Challenges in Accessing the Market

Overall, 59% of the farmers interviewed acknowledged having challenges in accessing the markets. Across the payams, only Malou pec had most farmers (57%) without challenges in accessing the market. In term of gender, more male farmers had challenges accessing the markets compared to female.



The main challenges faced in accessing markets are; high taxes on local commodities, insecurity along highways and poor road infrastructure. These challenges were similar to both gender and across payams except in Madit where poor road infrastructure was not cited as a challenge.



3.1.2 Gogrial East County

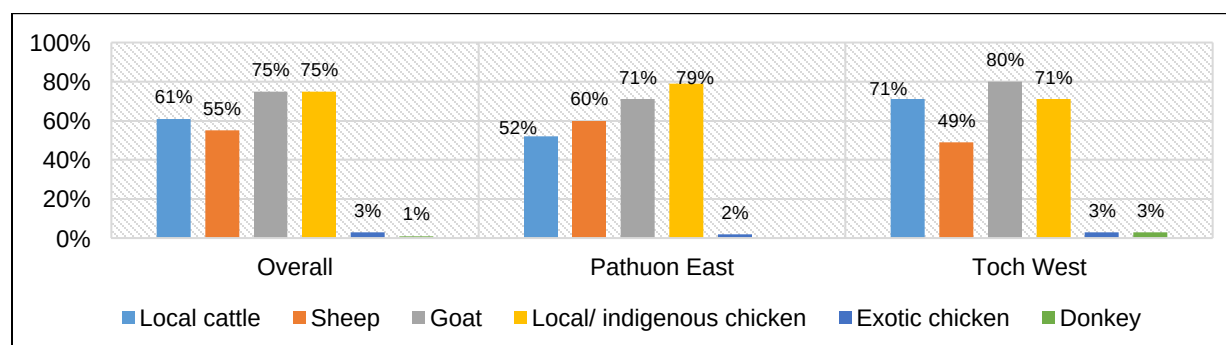
Socio-Demographic Characteristics

The table below shows the sociodemographic characteristics of the population of this survey. From the table, 96% were residents of the county and 4% IDPs. Most (52%) respondents were male, were married, did not have formal education, were between 18 and 35 years and were heads of their households. The average household in the county was 8 members, split equally in terms of gender.

		Overall	Pathuon East	Tuoch West
Respondent categories	Resident	96%	95%	97%
	IDP	4%	5%	3%
Gender	Male	52%	55%	49%
	Female	48%	45%	51%
Marital status	Married	92%	90%	94%
	Single	3%	5%	0%
	Widowed	5%	5%	6%
Age (Years)	18-35	45%	48%	43%
	36-45	43%	43%	43%
	46-60	12%	10%	14%
Average Household Size		8	8	8
Gender of household members	Male	4	3	4
	Female	4	5	4
Household Headship	Head of household	83%	83%	83%
	Non household head	17%	17%	17%
What is the highest level of your formal education	Not educated	71%	69%	74%
	Primary school	22%	24%	20%
	Secondary school	6%	7%	6%

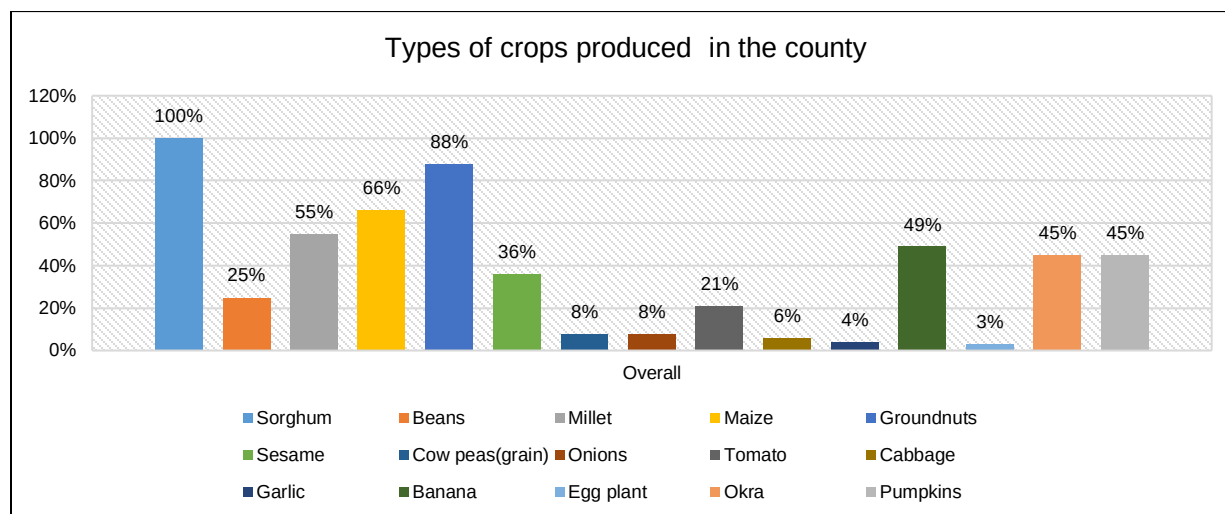
Livestock Production

The main livestock reared in the county were goats and indigenous chicken reared by 75% of farmers respectively. Local cattle were the third most reared livestock followed by sheep. Donkeys were only reared in Toch West payam. Notably, goats were the most reared livestock in Toch West payam compared to local chicken in Pathuon East.

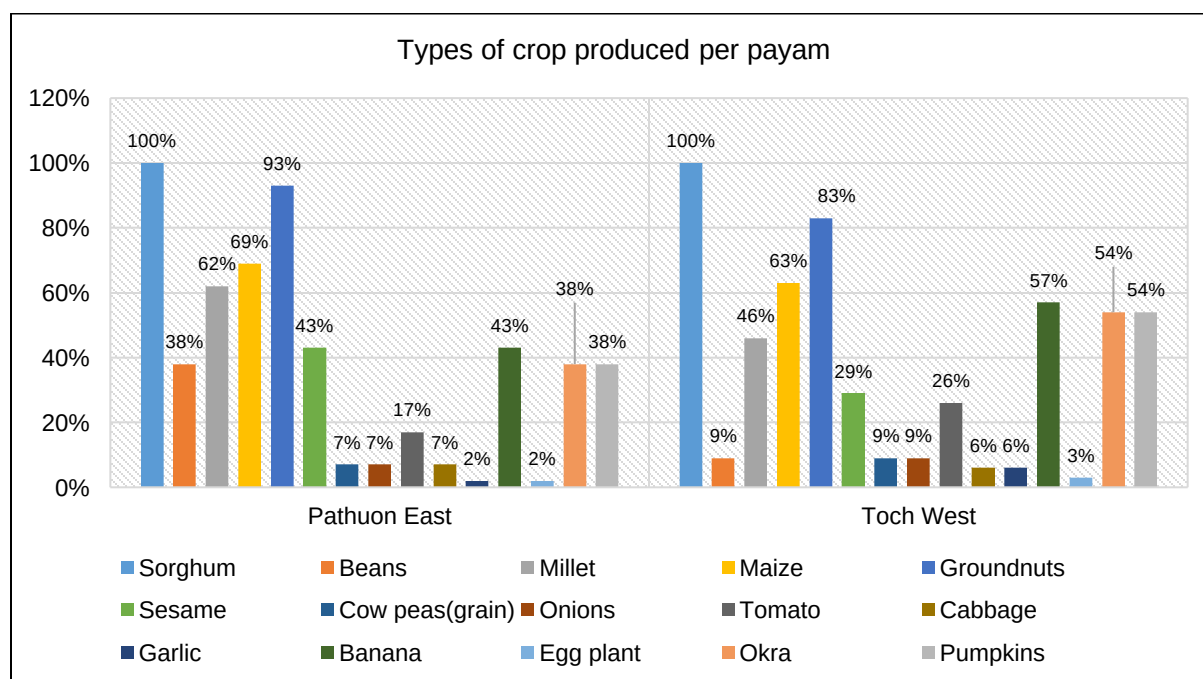


Crop Production

All farmers (100%) surveyed in this county produced sorghum. The second most produced crop was groundnuts produced by 88% followed by maize and millet. Other crops produced across the two payams are beans, okra, sesame and pumpkins as shown in the chart below. This trend was similar for both male and female farmers as well as across all age groups.

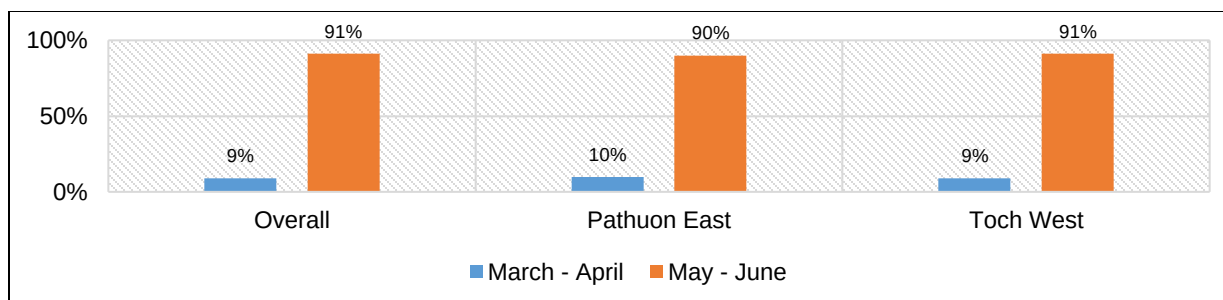


The chart below shows types of crops produced per payam.



Crop Planting Seasons

The county had one main crop planting season which occurred between May and June. Most farmers (91%) planted their crops during this season and only 9% planted their crops during the March to April season. The Chart below shows crop planting seasons in the county.



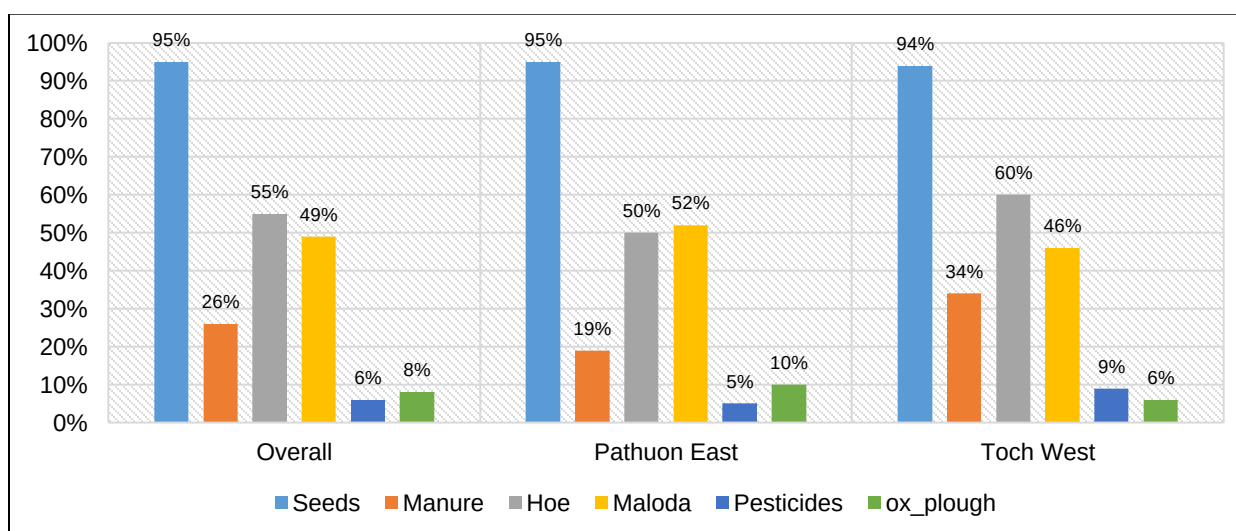
Size of Land Cultivated

The average size of land under crop farming in a year was 2.9 feddans per farmer. Among the three payams, Pathuon West had the biggest size of land under crops. Male farmers farmed larger sizes of land compared to female farmers.

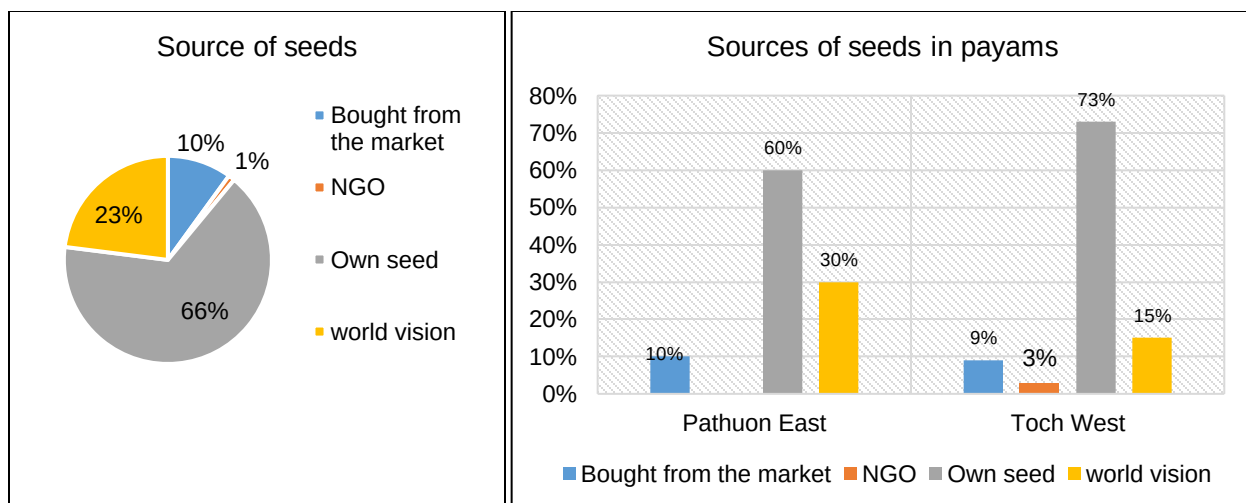
	Overall	Pathuon East	Tuoch West	Male	Female
Average size of land planted in a year (Feddans)	2.9	3.1	2.7	3.1	2.7

Farm Inputs Used by Farmers

The main inputs used by farmers in the county were seeds, hoes, malodas, manure, ox plough and pesticides. These were used in all the payams. Manure was mainly made by farmers from their own cattle while malodas, hoes and pesticides were mainly bought from the market and agro dealers. Notably, 20% of farmers had accessed pesticides from World Vision.

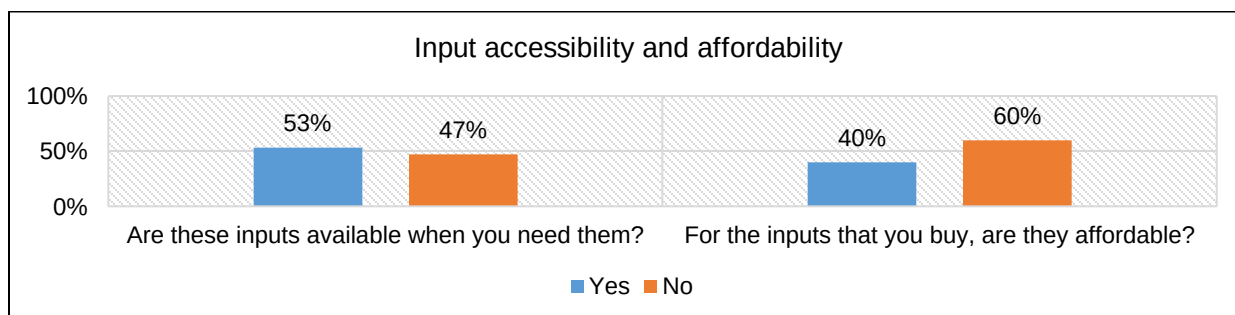


Overall, most of the farmers used between 1 to 4 kilograms of seeds per feddan. The main source of seeds in the county was own seeds followed by World Vision. The trend was similar across the payams. Notably, only farmers from Tuoch West Payam had accessed seeds from other NGOs.

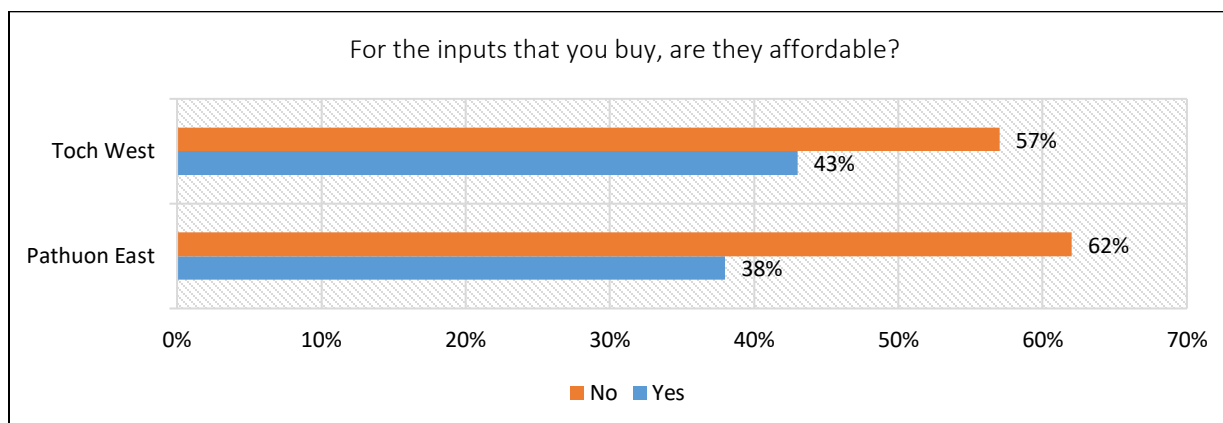


Input Accessibility and Affordability

Inputs were readily available to 53% of farmers in the county and affordable to 40% of the farmers. More farmers in Tuoch West Payam felt inputs were affordable compared to those in Pathuon East.

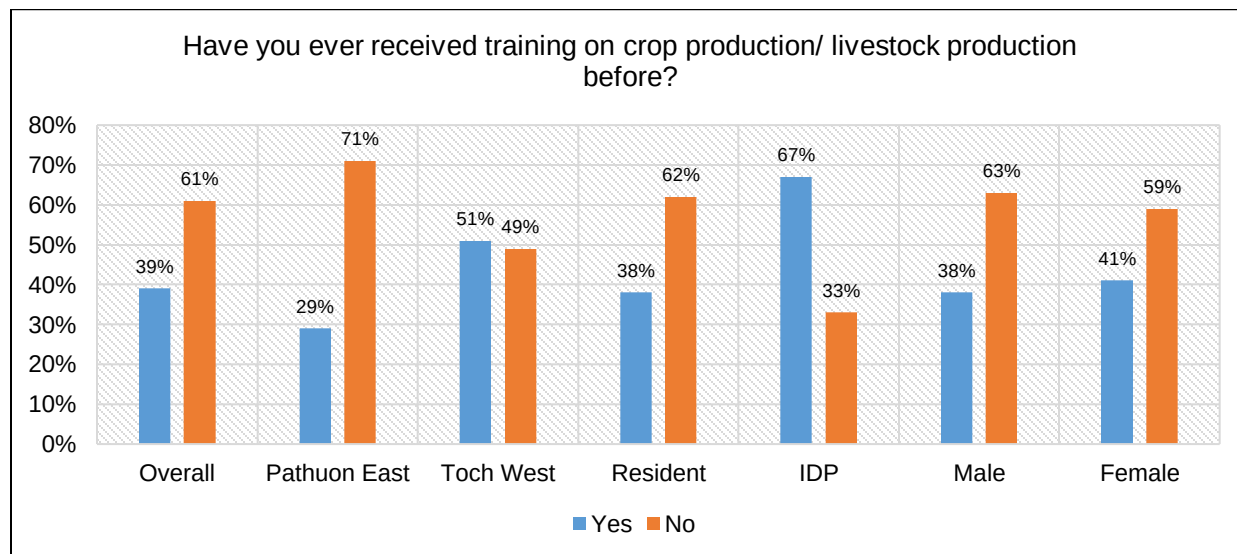


Affordability by Payam was as shown below.

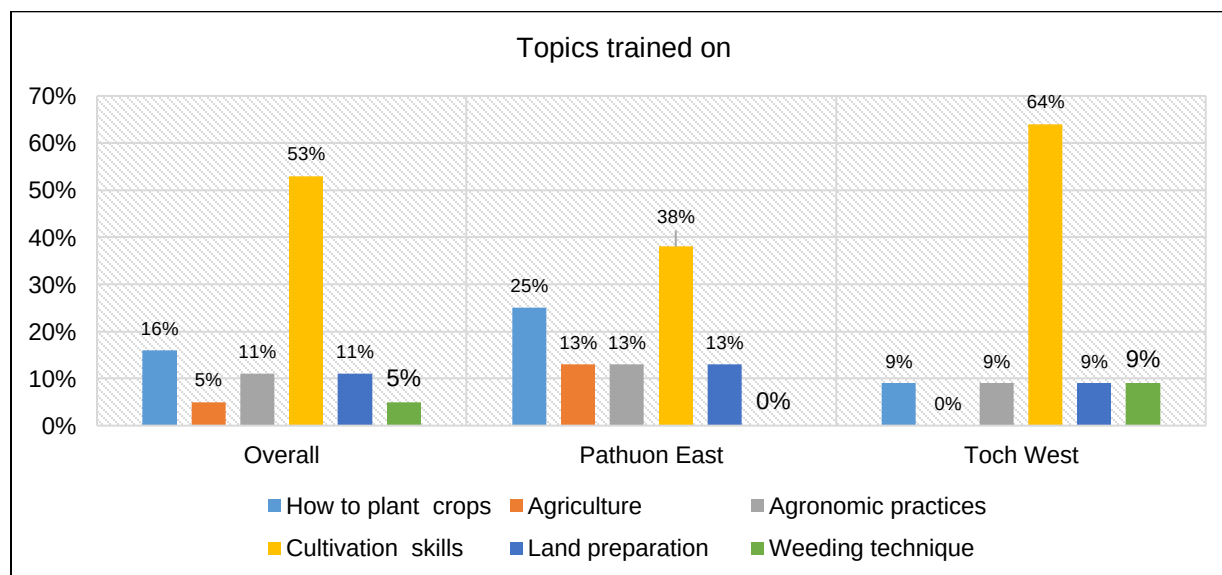


Training on Crop Production/ Livestock Production

Overall, only 39% of farmers in the county had been trained on crop production or livestock production. Slightly more than half of the respondents in Tuoch West payam had been trained compared to 29% of those in Pathuon East. More IDPs had been trained compared to residents while more female farmers had been trained compared to male farmers as shown below.

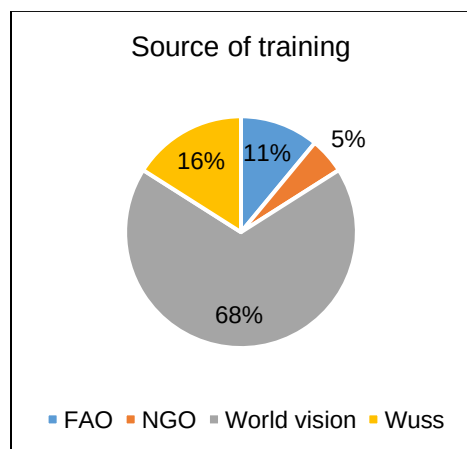


Out of those who were trained, most (53%) were trained on cultivation skills. Notably, more farmers in Tuoch West Payam had been trained on cultivation skills compared to Pathuon East.



Source of Training

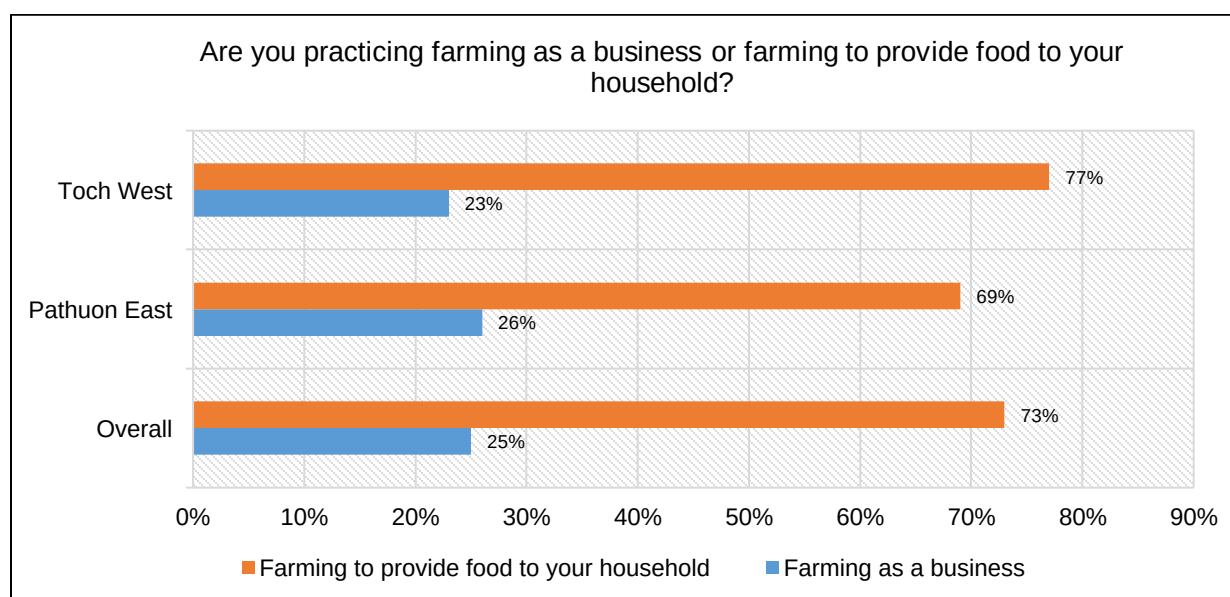
Most (68%) of the farmers received training from world Vision. World vision provided training on cultivation skills, how to plant crops, agronomic practices, weeding techniques and land preparation. The table below shows the topics trained and the trainers. All the training accessed was done in a duration of between one and seven days.



	Overall	FAO	NGOs	World Vision	Wuss
How to plant crops	16%			23%	
Agriculture	5%				33%
Agronomic practices	11%			15%	
Cultivation skills	53%	100%	100%	38%	67%
Land preparation	11%			15%	
Weeding technique	5%			8%	

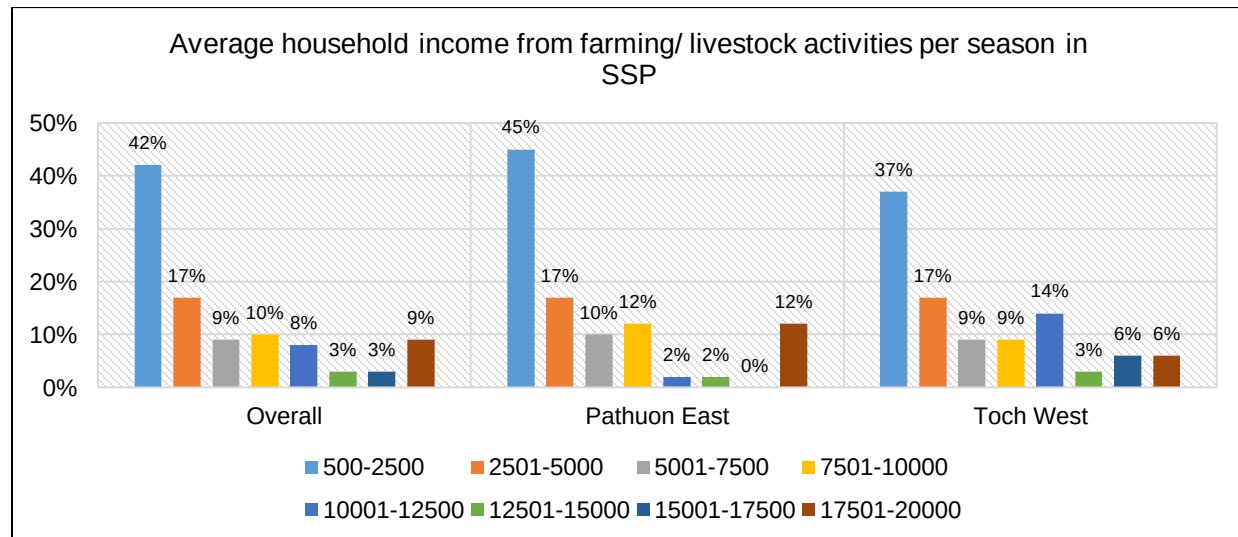
Farming and Business

Overall, 73% of the respondents in the county farmed to provide food for their household and 25% farmed as a business. Farming as a business was done by more famers in Pathuon East Payam compared to Tuoch West payam. Farming as a business was mainly done to generate income, for economic growth, to afford inputs and while farming for food was due to food insecurity. Low yields also hindered the uptake of farming as a business.



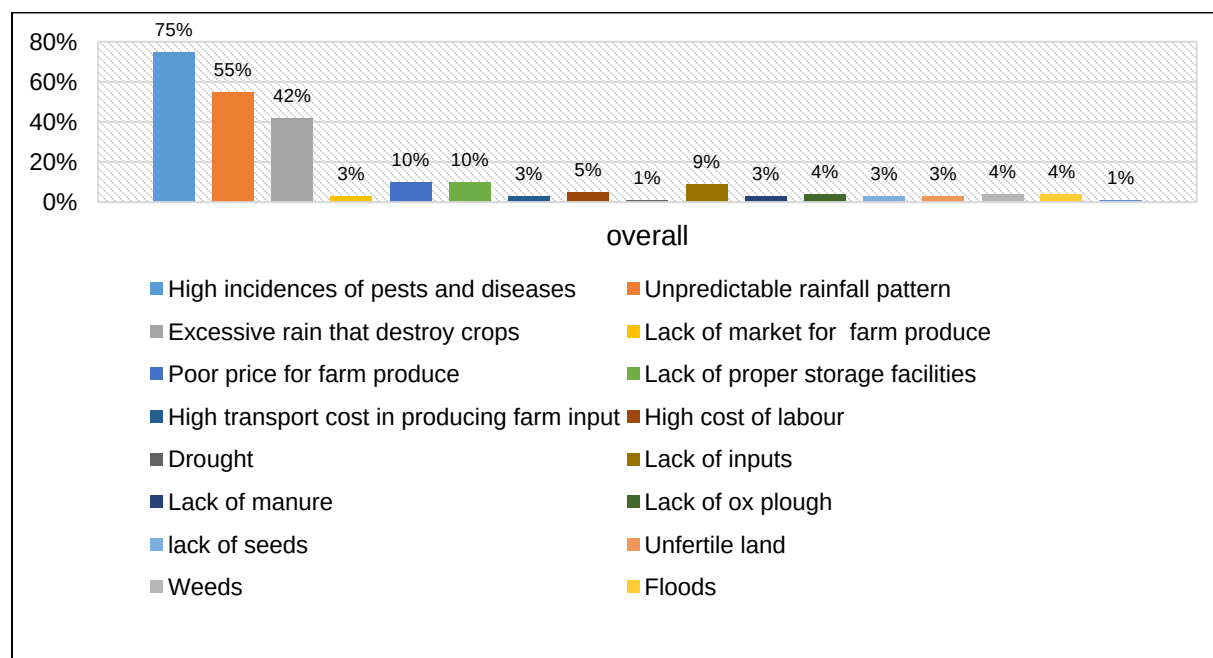
Household Income

Household income from crop farming and livestock activities per season for most farmers in the county (42%) earned between SSP 500 and SSP 2500 followed by 17% who earned between SSP 2501 and SSP 5000. Only 9% of the farmers earned the highest income of SSP 17,501 to SSP 20,000.



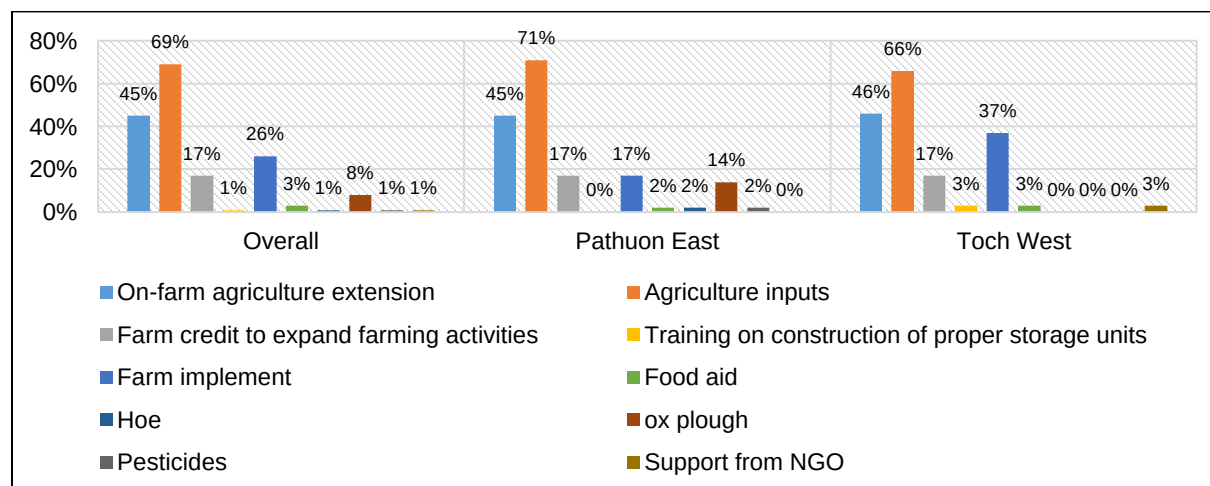
Challenges in Crop Farming

The main challenge faced by crop farmers in the county is high incidences of pests and diseases (75%) followed by unpredictable rainfall (55%) and excessive rain among others as shown below. This trend was cross cutting across the payams.



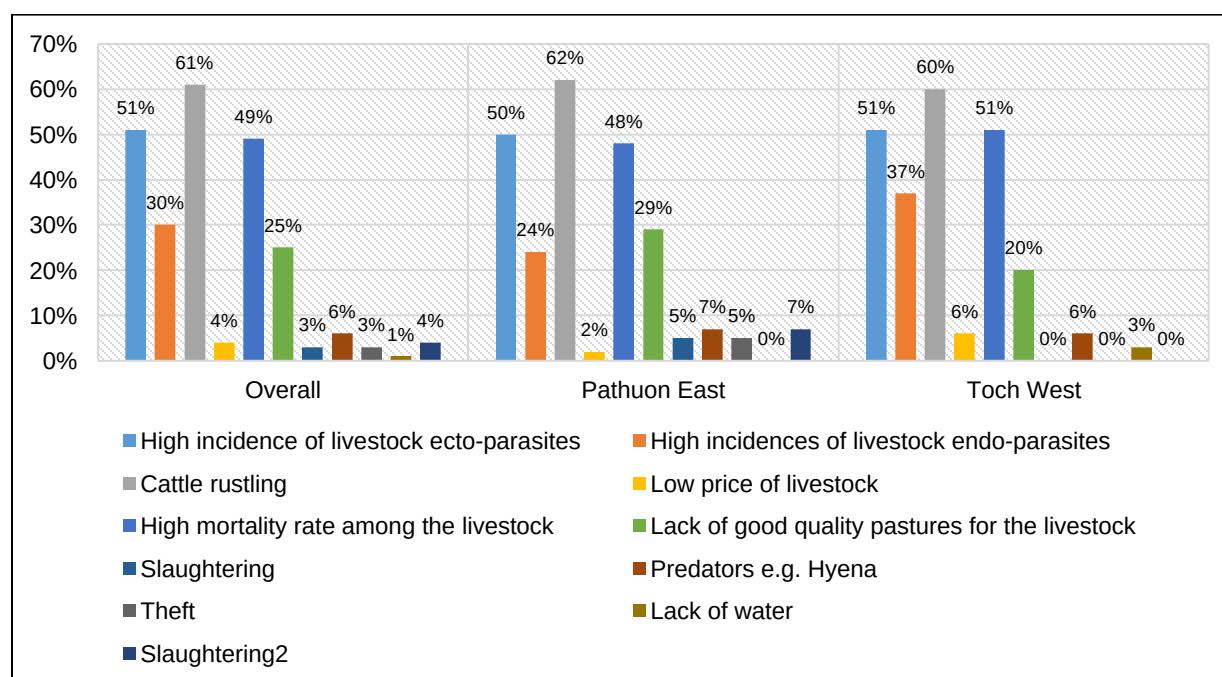
Technical Support Needed to Improve Crop Productivity and Production

The main technical support needed by farmers in the county was on agricultural inputs (69%), on-farm agriculture extension (45%) and farm implements (26%). Others included access to credit, training on construction of proper storage units, ox ploughs and tractors as shown in the chart below.



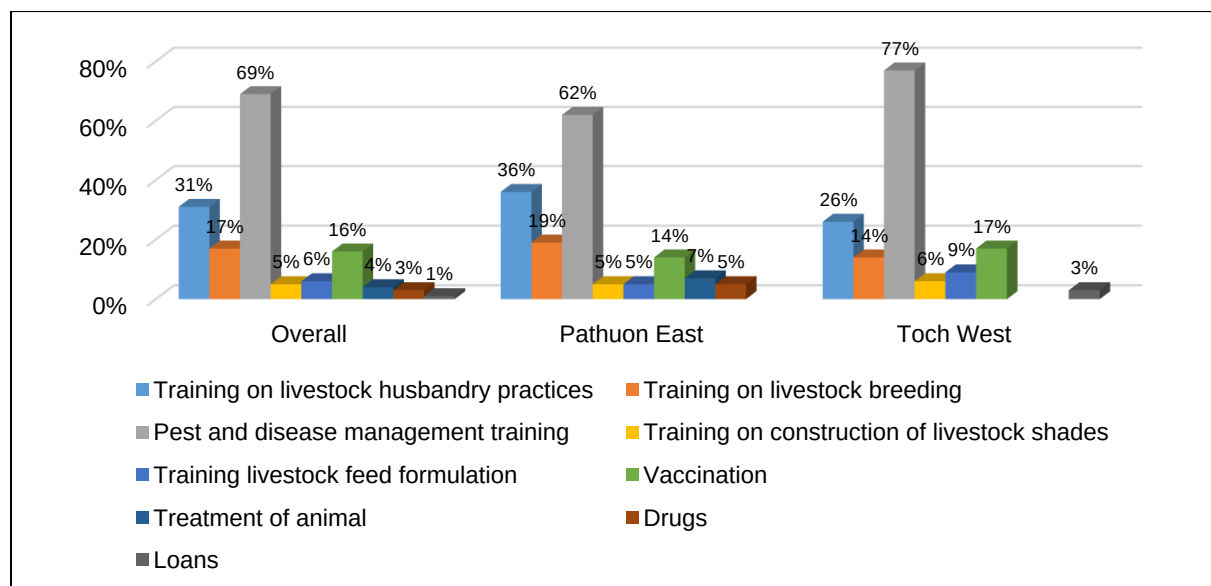
Challenges in Livestock Production

The main challenge in livestock production in the county included cattle rustling, high incidences of livestock ecto-parasites and endo parasites, high livestock mortality rates, lack of quality pastures and low prices of livestock. The chart below shows the challenges faced in livestock production.



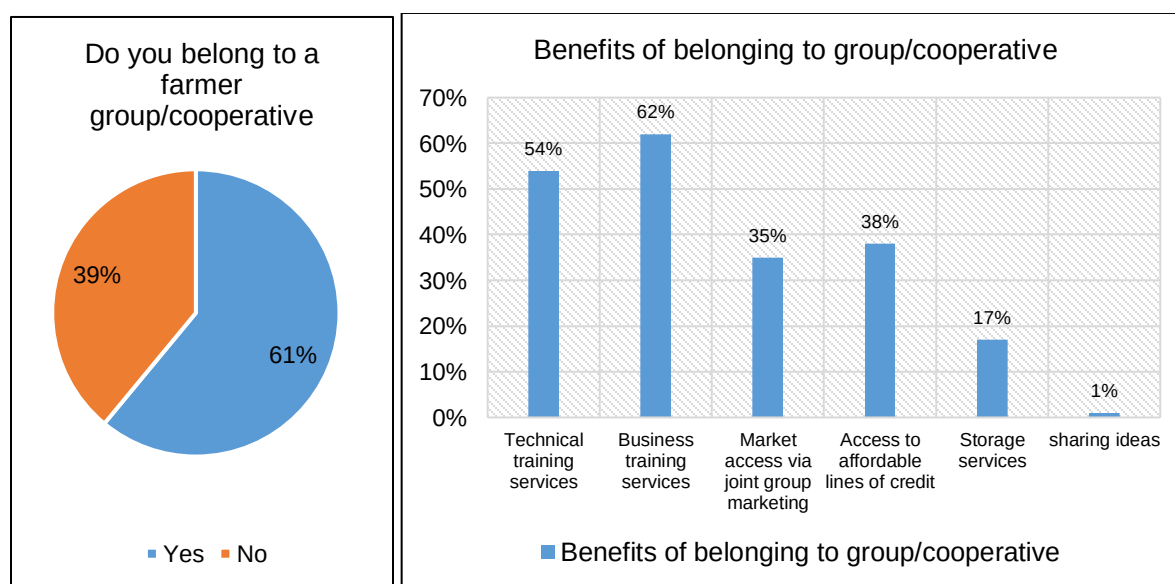
Technical Support Needed to Improve Livestock Production

To address the challenges identified above, farmers required support in form of pest and disease management (69%), training on livestock husbandry practices (31%) and training on livestock breeding (17%) among others as shown in the chart below. This trend was identical across the two payams.



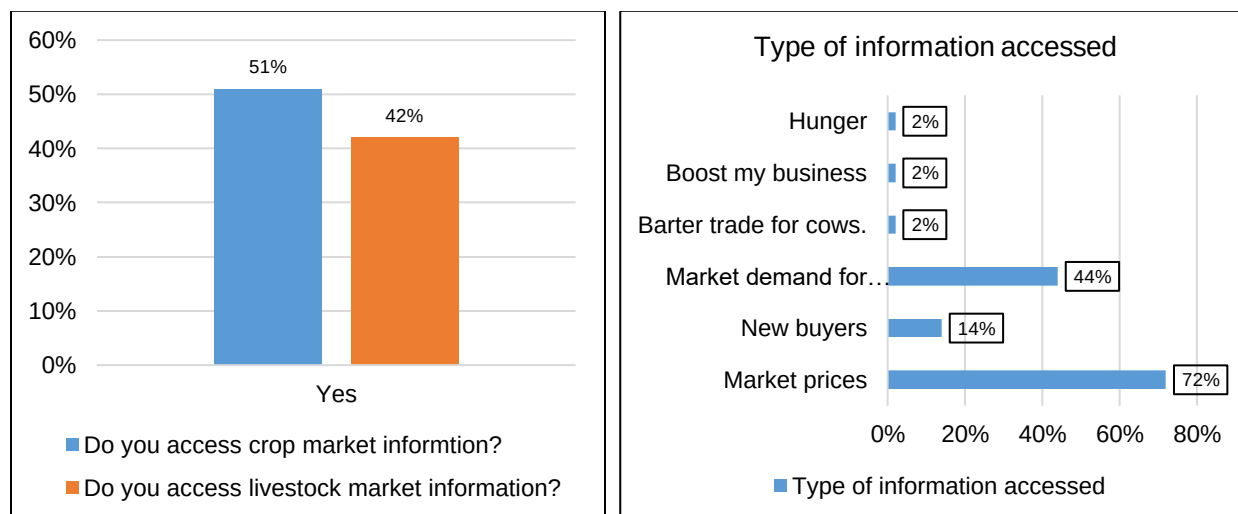
Farmer Group/ Cooperative Membership

Overall, 61% of the respondents had membership to farmer groups/cooperatives. The main benefits associated with membership to groups/cooperatives included business training services, technical training, access to affordable lines of credit and access to market through joint marketing among others as shown below.



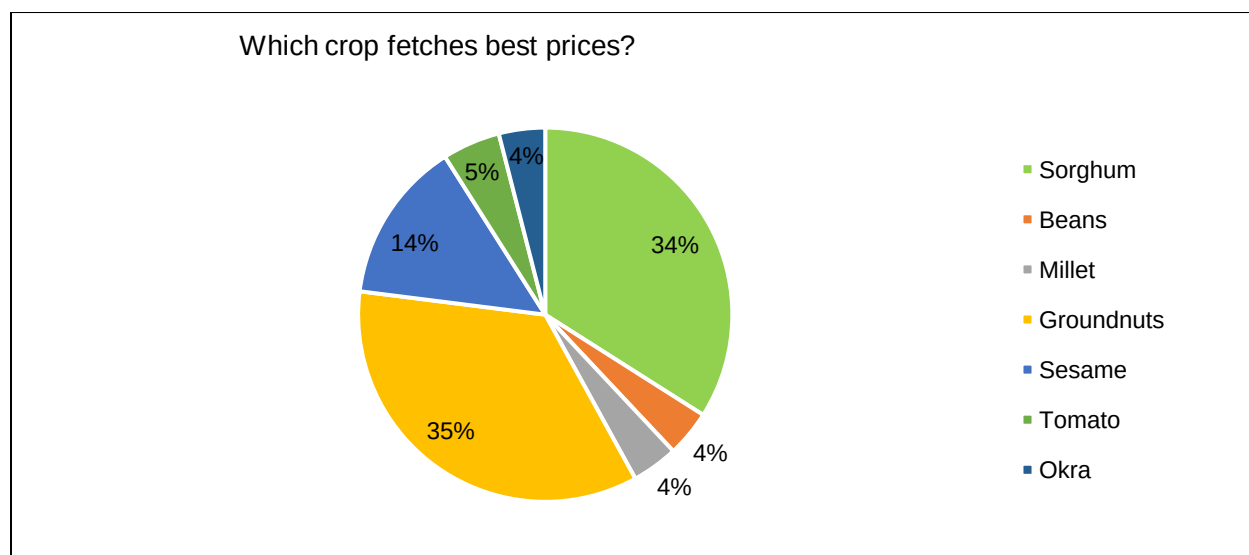
Access to Market Information

Overall, 51% of farmers in the county had access to crop market information and 42% accessed livestock market information. The main type of information accessed is market prices (accessed by 72%), market demand (accessed by 44%) and information on new buyers (accessed by 14%).



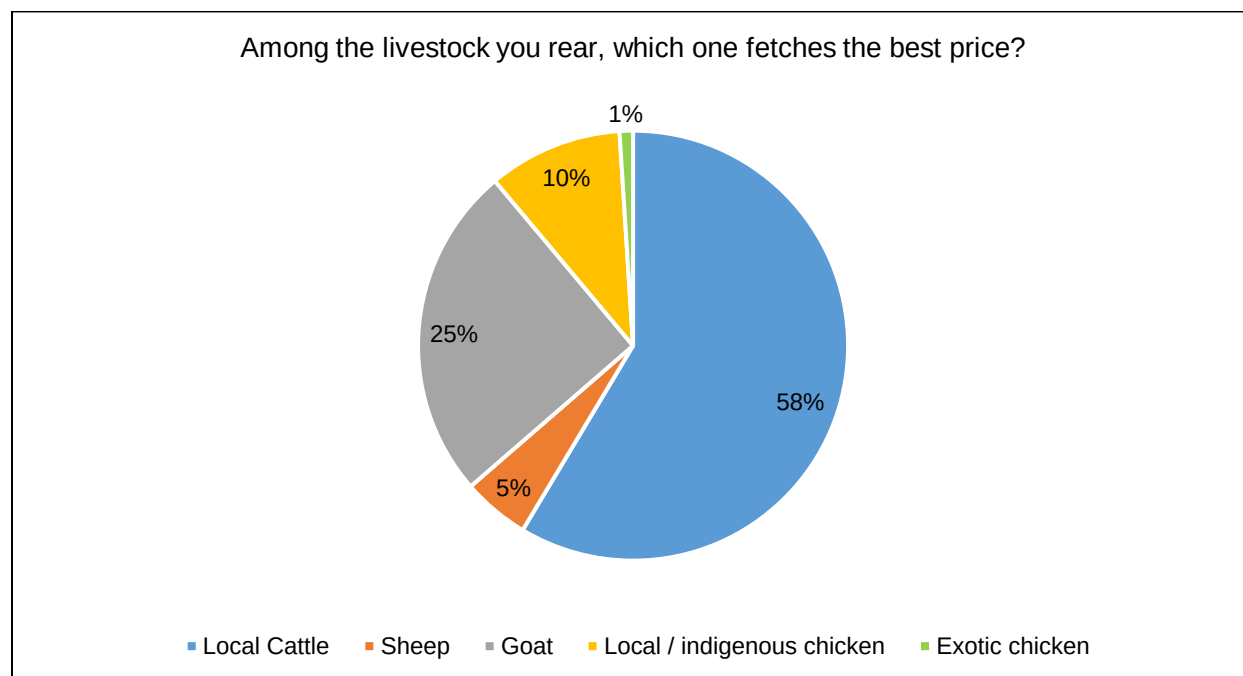
Crops and Market Prices Fetched

Among the crops farmed in the county, groundnuts fetched the best prices in the market followed by sorghum and sesame. Most farmers fetched between SSP 1500 per 90kg bag of sorghum, between SSP 7000 to 15000 per 90 kg bag of groundnuts and between SSP 25000 and SSP 35000 per 90 kg bag of Sesame.



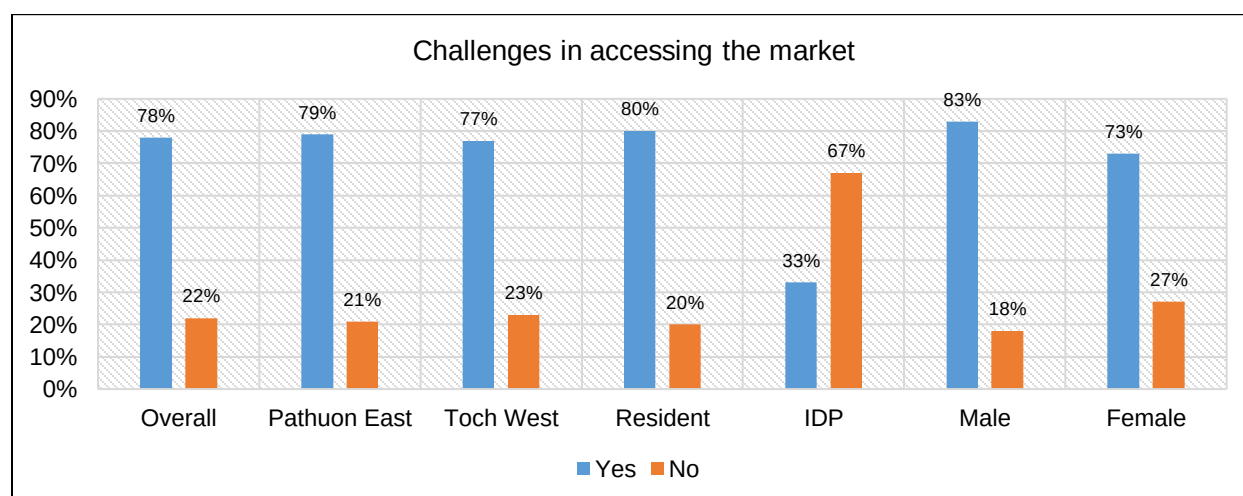
Livestock and Market Prices

Most farmers (58%) cited local cattle as the livestock that fetched best prices in the markets followed by goat (25%) and local chicken (10%). Most farmers in the county fetched SSP 100,000 per cattle, SSP 8,000 per sheep and SSP 3,000 to SSP 10,000 per goat. Exotic chicken fetched SSP 1000 while indigenous chicken fetched between SSP 300 and SSP 1000.

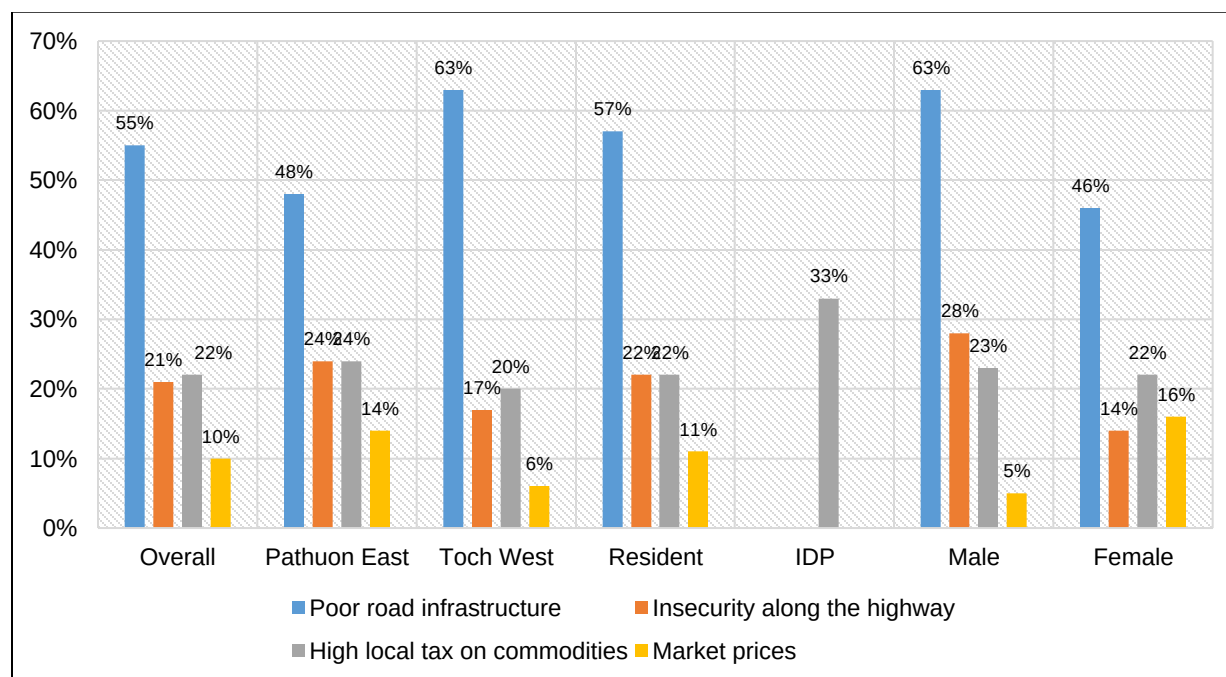


Challenges in Accessing the Market

Overall, 78% of the farmers interviewed acknowledged having challenges in accessing the markets. More male farmers had challenges accessing the market compared to female farmers.



The main challenges faced in access to markets included; poor road infrastructure, high taxes on local commodities and insecurities along the highways. These challenges were similar to both gender but the only challenge facing IDPs high taxes.



3.1.3 Jur River County

Socio-Demographic Characteristics

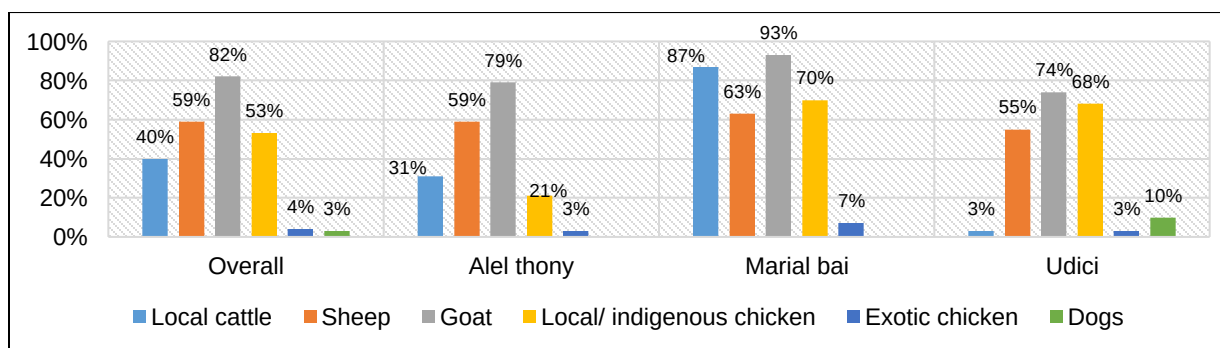
The table below shows the sociodemographic characteristics of the population of this survey. Most (54%) respondents were female, were married, did not have formal education, were between 18 and 35 years and were heads of their households. The average household in the county was 8 members, split equally in terms of gender. Notably, in Udici Payam, most of the respondents were male and none were above 60 years.

		Overall	Alel thony	Marial bai	Udici
Gender	Male	46%	31%	43%	61%
	Female	54%	69%	57%	39%
Marital status	Married	77%	90%	73%	68%
	Single	12%	10%	10%	16%
	Divorced/separated	4%	0%	0%	13%
	Widowed	7%	0%	17%	3%
Age (Years)	18-35 years	67%	79%	43%	77%
	36-45 years	27%	14%	47%	19%
	46-60 years	3%	3%	3%	3%
	60+ years	3%	3%	7%	0%
Average Household Size		8	8	8	8
	Male	4	4	4	4

Gender of household members	Female	4	4	4	4
Household Headship	Head of household	67%	59%	77%	65%
	Non household head	33%	41%	23%	35%
What is the highest level of your formal education	Not educated	58%	69%	63%	42%
	Primary school	29%	28%	27%	32%
	Secondary school	13%	3%	10%	26%

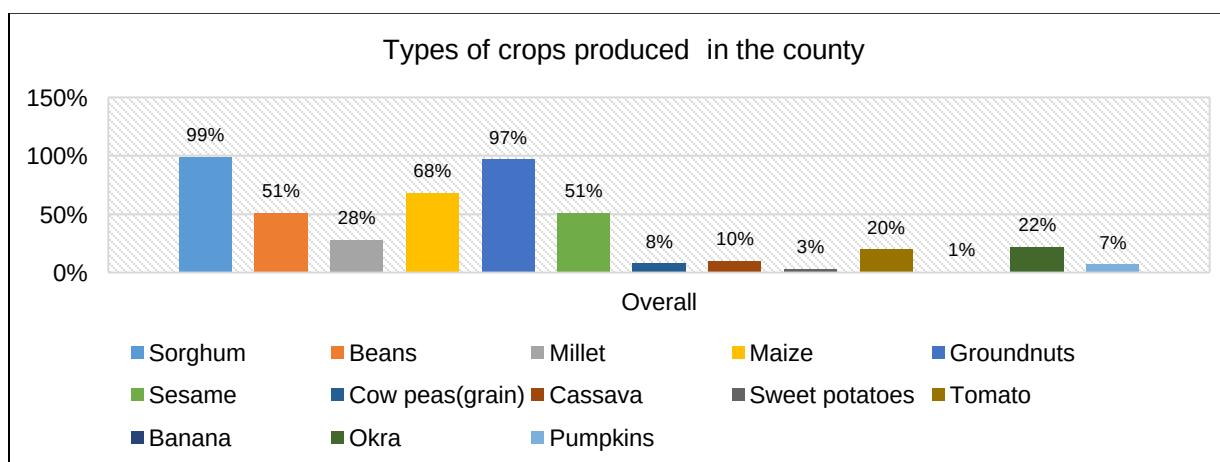
Livestock production

The main livestock reared in the county were goats, reared by 82% of the respondents, followed by sheep, indigenous chicken and goats. Notably, Cattle were mainly reared in Alel Thony and Marial Bai Payams. Only 3% of respondents in Udici payam. Rearing of local chicken was most common in Udici and Marial Bai payams compared to Alel Thony Payam.

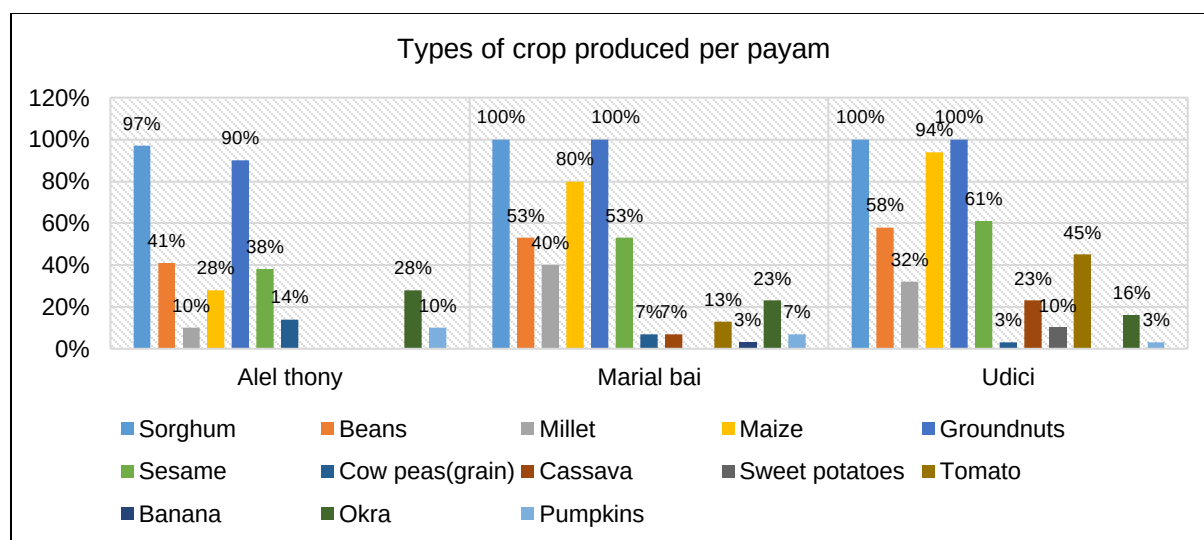


Crop Production

Overall, 99% of all the respondents surveyed in this county produced sorghum and 97% groundnuts. The other main crops in the county included; maize, sesame, beans, millet, okra and tomatoes. Notably, sorghum and groundnuts were produced by all respondents in Udici and Marial Bai payams.

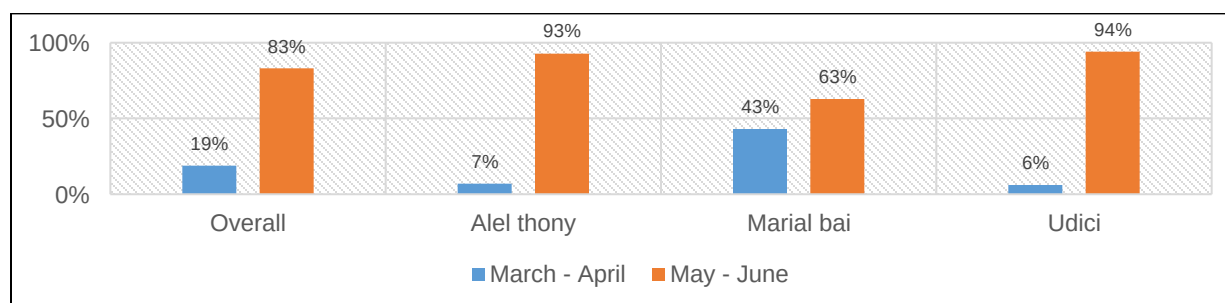


The chart below shows types of crops produced per payam.



Crop planting seasons

The county had one main crop planting season which occurred between May and June. Most farmers (83%) planted their crops during this season and only 19% planted their crops during the March to April season. Particularly, a significant number of farmers (43% in Marial Bai payam planted during the March to April season. The Chart below shows crop planting seasons in the county.



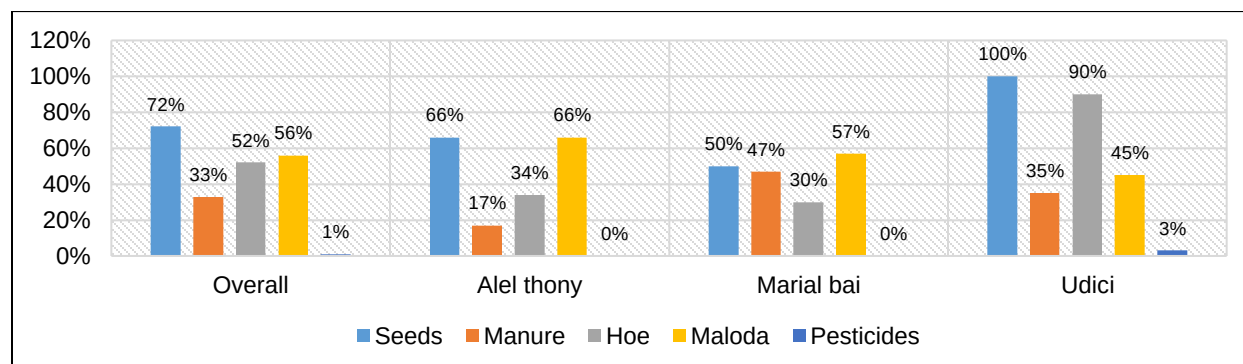
Size of land cultivated

The average size of land under crop farming in a year was 3.5 feddans per farmer. Among the three payams, Marial Bai boasted the largest size of land under crops while Alel thony had the least. Male farmers farmed larger sizes of land compared to female farmers.

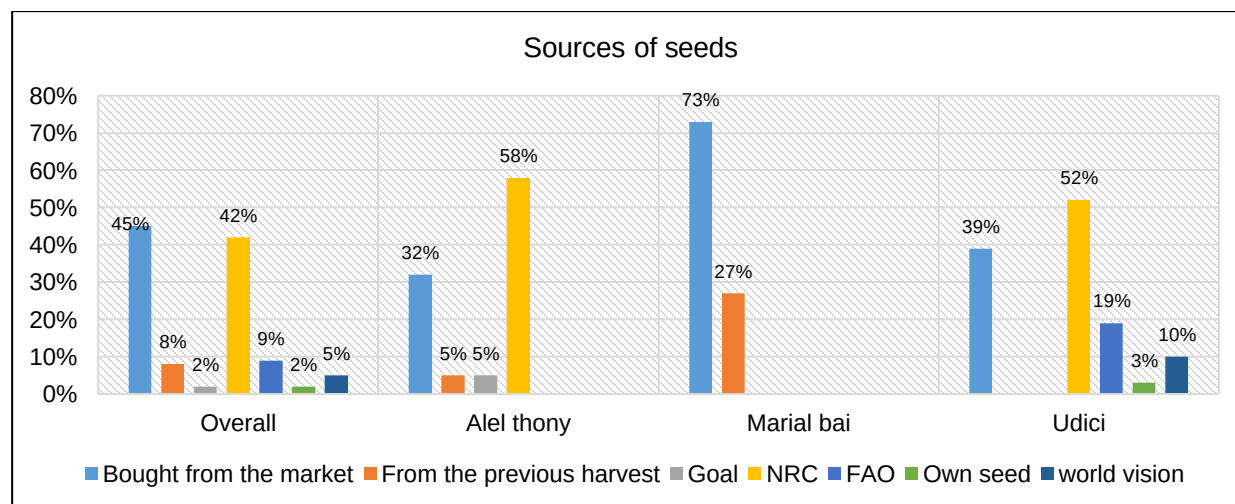
	Overall	Alel thony	Marial bai	Udici	Male	Female
Average size of land planted in a year (Feddans)	3.5	2.8	4.2	3.5	4.3	2.9

Farm Inputs used by farmers

The main inputs used by farmers in the county were seeds (72%), malodas (56%), hoes (52%) and manure (33%). These were used across all the payams. Pesticides were only used in Udici payam, and only by 3% of the respondents. Manure was mainly made by farmers from their own cattle while malodas, hoes and pesticides were mainly bought from the market and agro dealers. Notably, 6% of farmers had accessed hoes from World Vision.

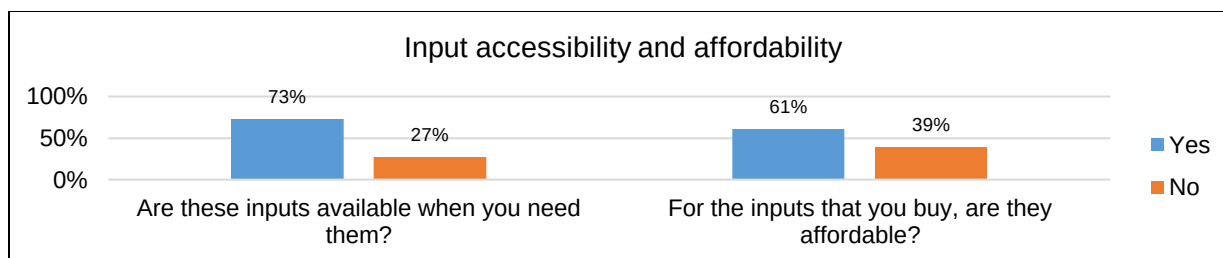


Overall, most of the farmers used between 1 to 4 kilograms of seeds per feddan. The main source of seeds in the county was purchasing from the market followed by NRC. Marial Bai payam sourced seeds from the market and from previous harvest only while in Udici, none of the farmers relied on seeds from previous harvests.

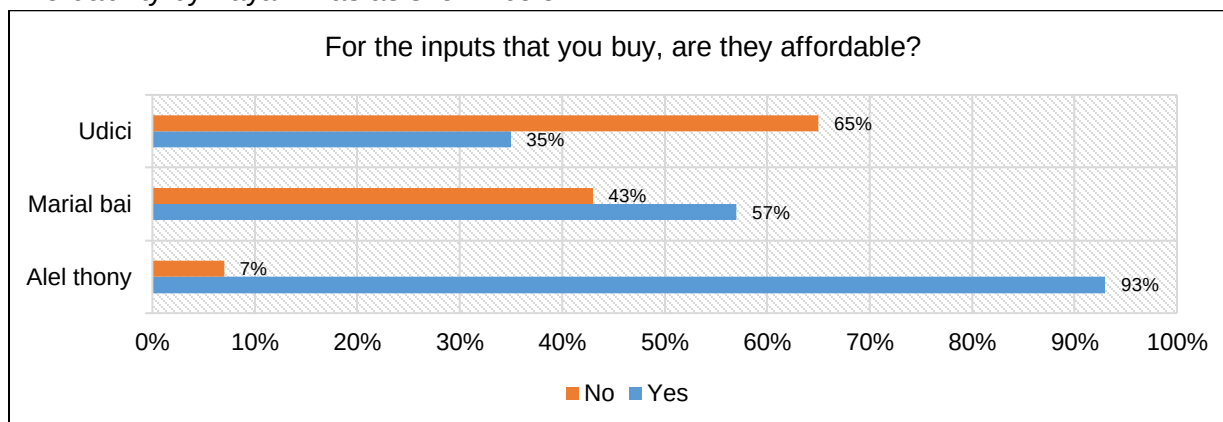


Input accessibility and Affordability

Inputs were readily available to 73% of farmers in the county and affordable to 60% of the farmers. Marial Bai payam had the least number of farmers (53%) having access to inputs while Udici had the most (87%). Notably, inputs were affordable to 93% of farmers in Alel Thony compared to 35% in Udici payam.

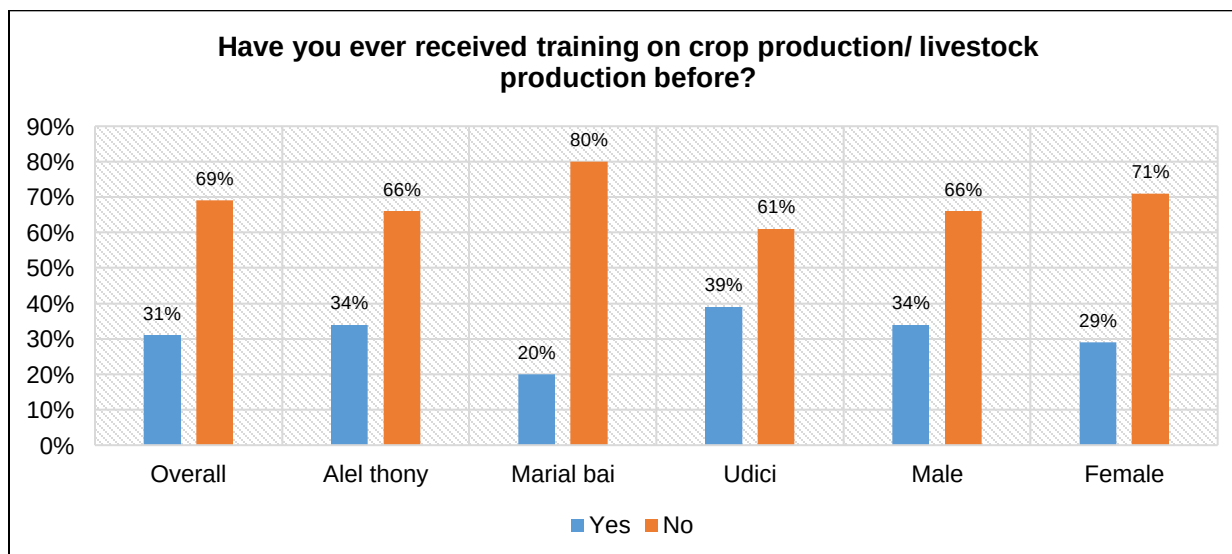


Affordability by Payam was as shown below.

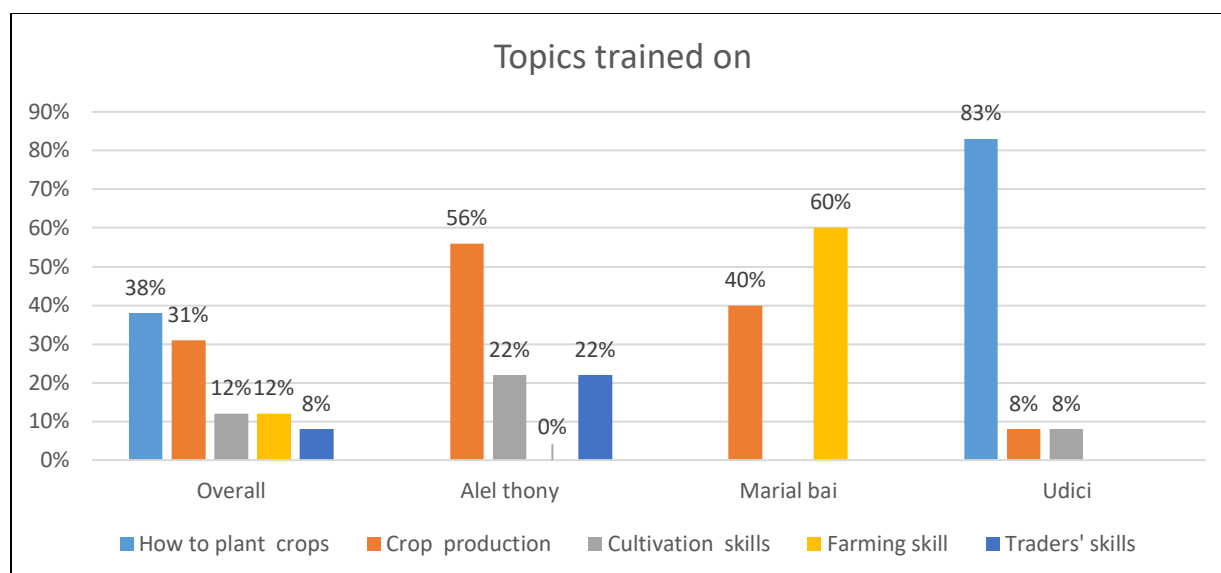


Training on crop production/ livestock production

Overall, only 31% of farmers in the county had been trained on crop production or livestock production. Udici payam had the most trained farmers while Marial bai had the lowest. More male farmers had been trained compared to female farmers as shown below.

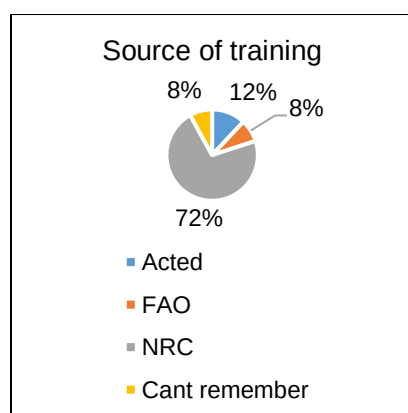


Out of those who were trained, most (38%) were trained on how to plant crops. Notably, farmers in Marial bai were only trained in farming and crop production skills.



Source of training

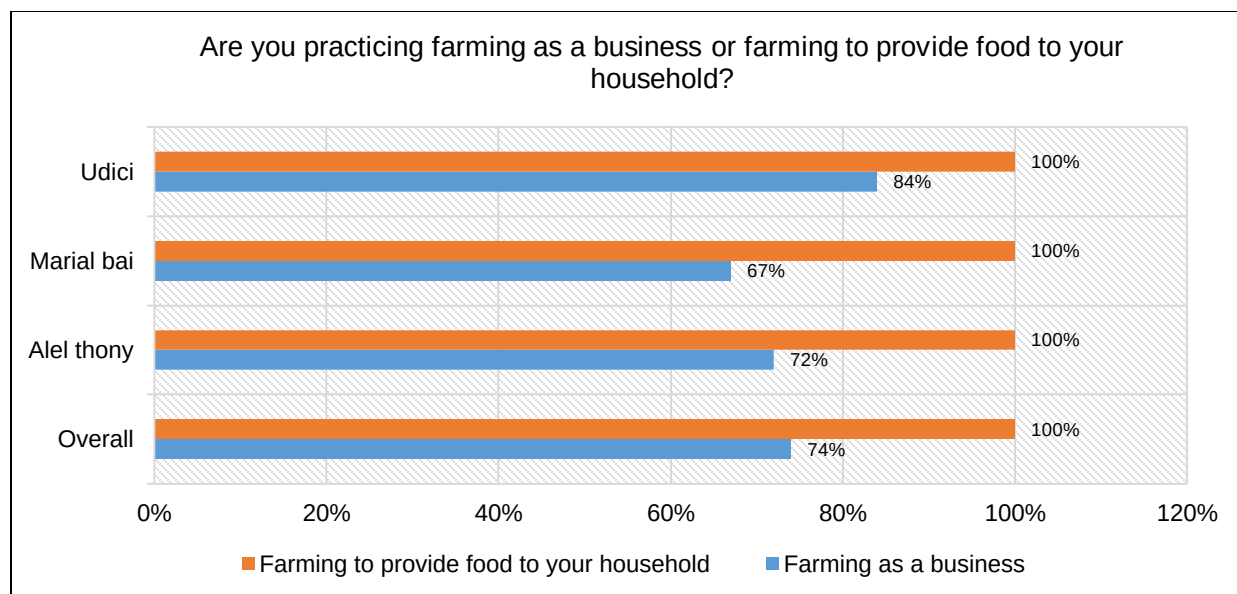
Most (72%) of the farmers received training from NRC. Other trainers included FAO and Acted. The table below shows training and providers. The training was conducted in an average of 4 days per topic.



	Overall	acted	FAO	NRC	Can't remember
How to plant crops	38%	0%	0%	53%	0%
Crop production	31%	33%	50%	21%	100%
Cultivation skills	12%	0%	50%	11%	0%
Farming skill	12%	67%	0%	5%	0%
Traders' skills	8%	0%	0%	11%	0%

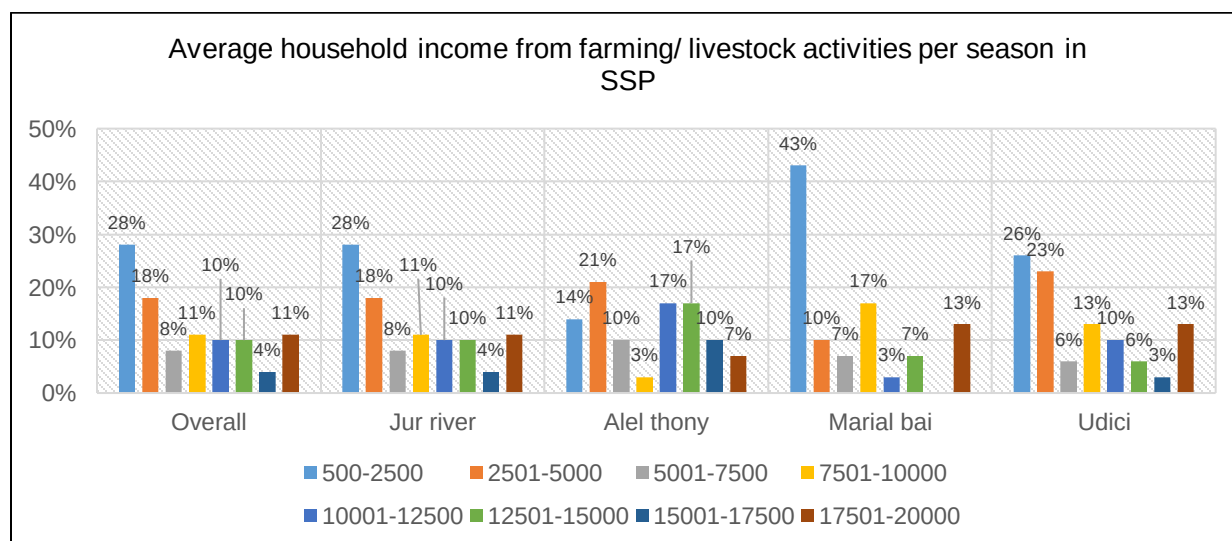
Farming and Business

All farmers interviewed in the county were involved in farming to provide food for their households. Additionally, 74% were engaged in farming as a business. Most of those who undertook farming as a business in addition to being a source of food were from Udici payam. Farming as a business was mainly done to generate income, educate children, for economic growth, to afford inputs and while farming for food was due to food insecurity. Low yields also hindered the uptake of farming as a business.



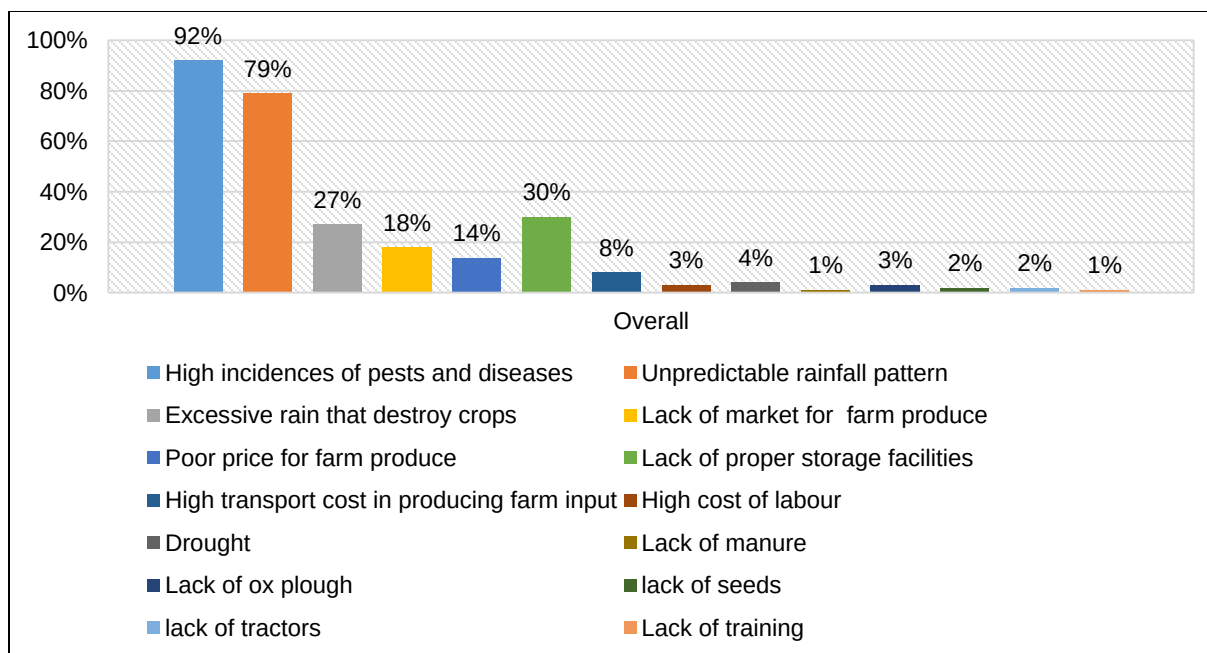
Household Income

Household income from crop farming and livestock activities per season for most farmers in the county (28%) earned between SSP 500 and SSP 2500 followed by 18% who earned between SSP 2501 and SSP 5000. Only 11% of the farmers earned the highest income of SSP 17,501 to SSP 20,000.



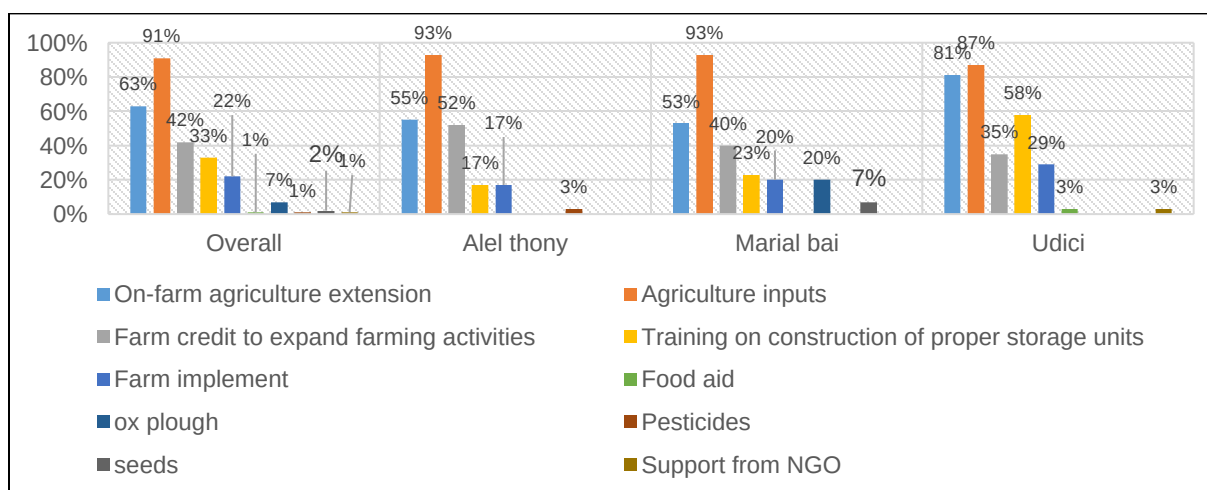
Challenges in Crop Farming

The main challenge faced by crop farmers in the county was high incidences of pests and diseases (92%) followed by unpredictable rainfall (79%) and lack of proper storage facilities among others as shown below. This trend was cross cutting across the payams and across gender.



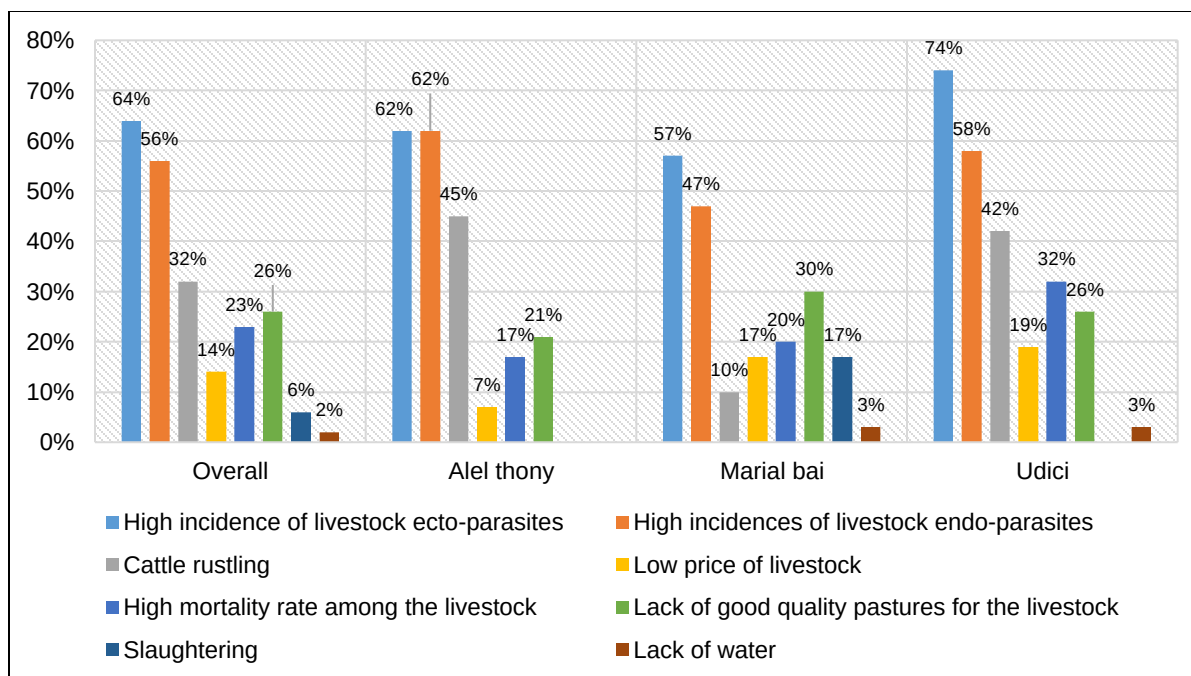
Technical support needed to improve crop productivity and production

The main technical support needed by farmers in the county was on agricultural inputs, needed by 91% of the farmers. Other technical support needs included; on-farm agriculture extension (63%) and farm credit to expand farming activities (42%) as shown in the chart below. Notably, 81% of farmers in Udici payam required extension services while on 3% of farmers in Alel Thony payam needed pesticides.



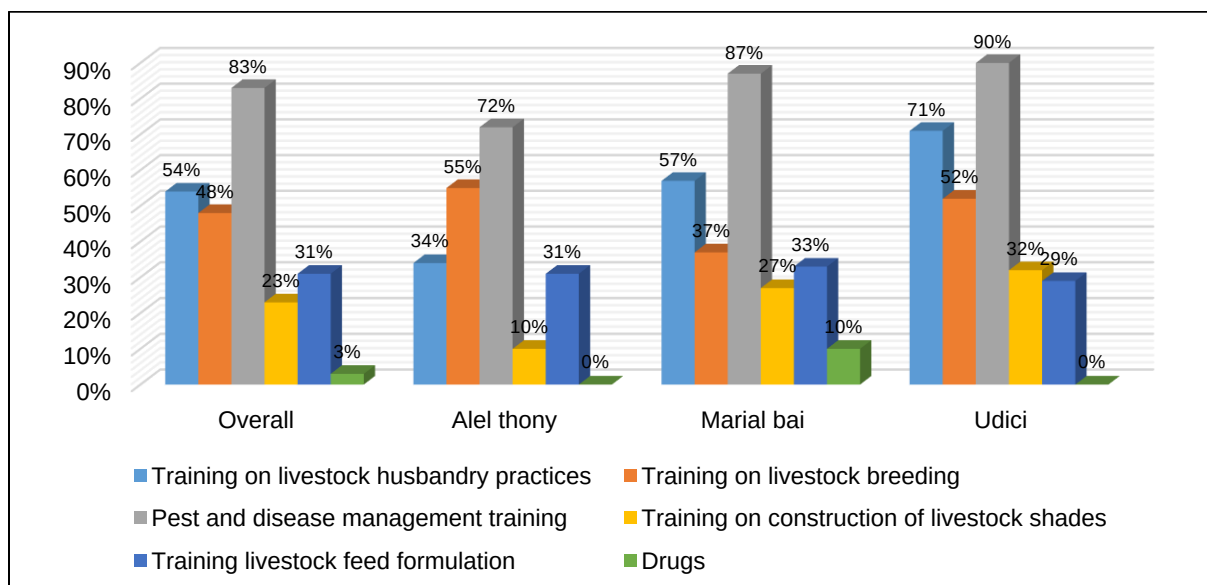
Challenges in Livestock production

The main challenge in livestock production in the county included high incidences of livestock ecto-parasites and endo parasites, cattle rustling, high livestock mortality rates and lack of quality pastures. The chart below shows the challenges faced in livestock production.



Technical support needed to improve livestock production

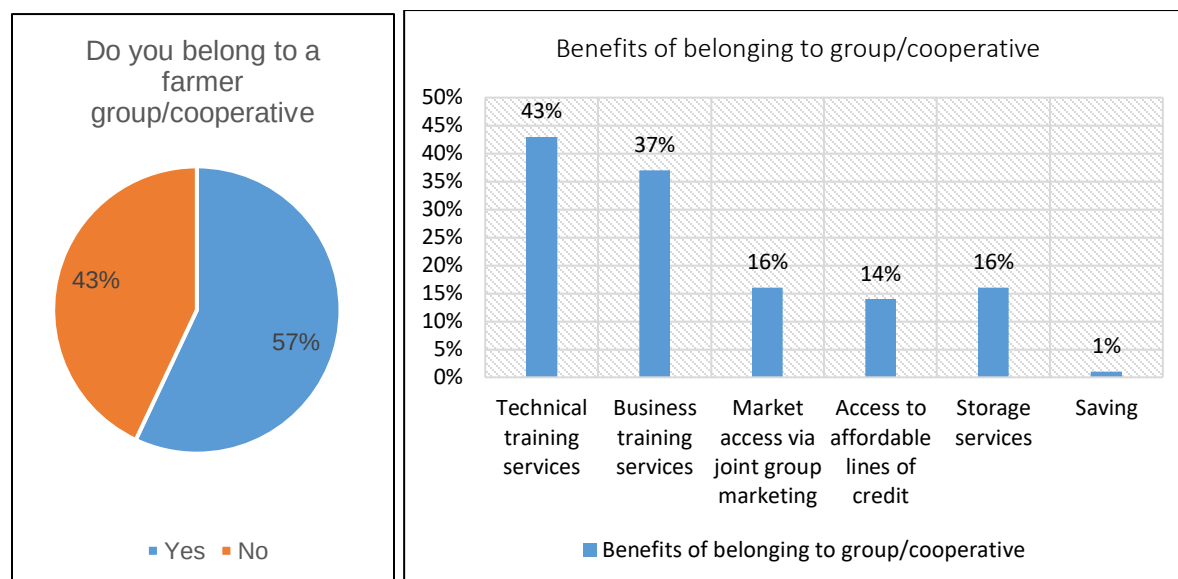
To address the challenges identified above, farmers required support in form of pest and disease management training (83%), training on livestock husbandry practices (54%) and training on livestock breeding (48%) among others as shown in the chart below. This trend was identical across the three payams.



Farmer group/ Cooperative membership

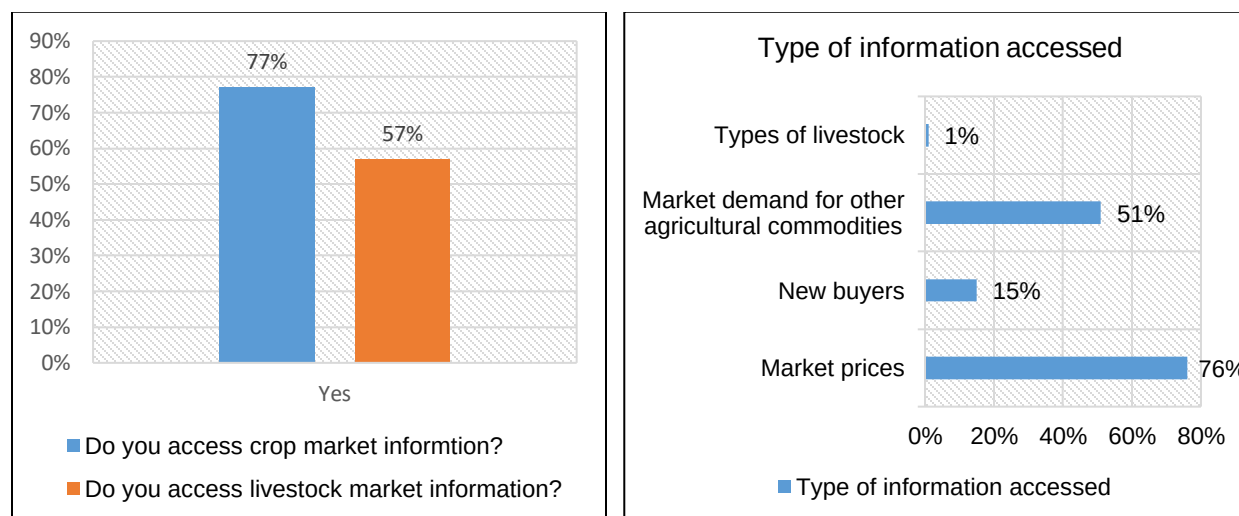
Overall, 57% of the respondents had membership to farmer groups/cooperatives. The main benefits associated with membership to groups/cooperatives included technical training,

business training services and access to market through joint marketing among others as shown below.



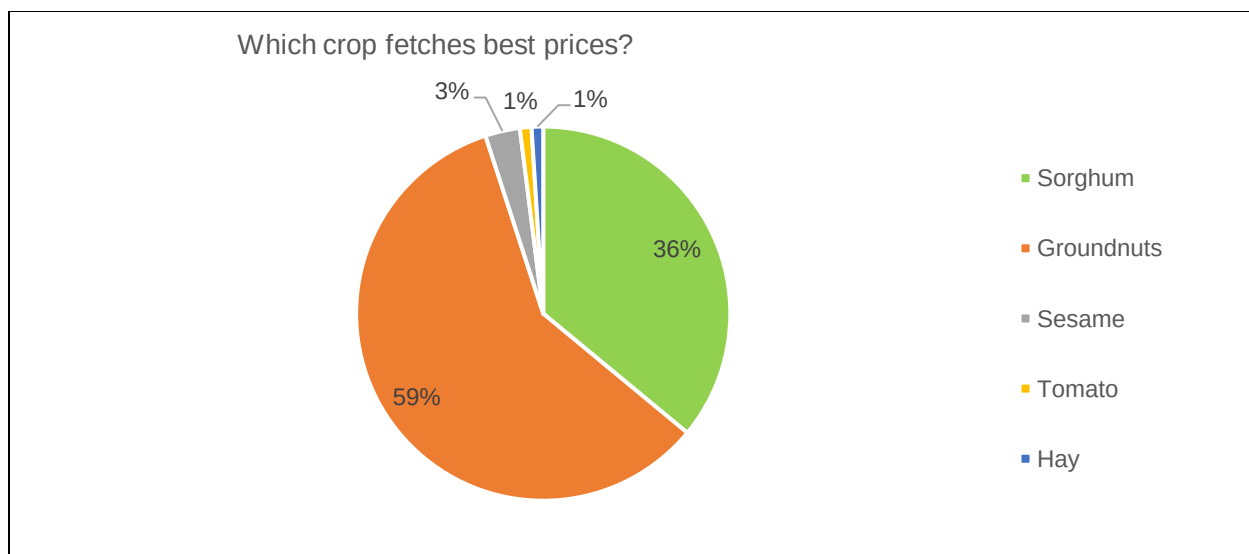
Access to Market information

Overall, 77% of farmers in the county had access to crop market information and 57% accessed livestock market information. The main type of information accessed is market prices (accessed by 76%), market demand (accessed by 51%) and information on new buyers (accessed by 15%).



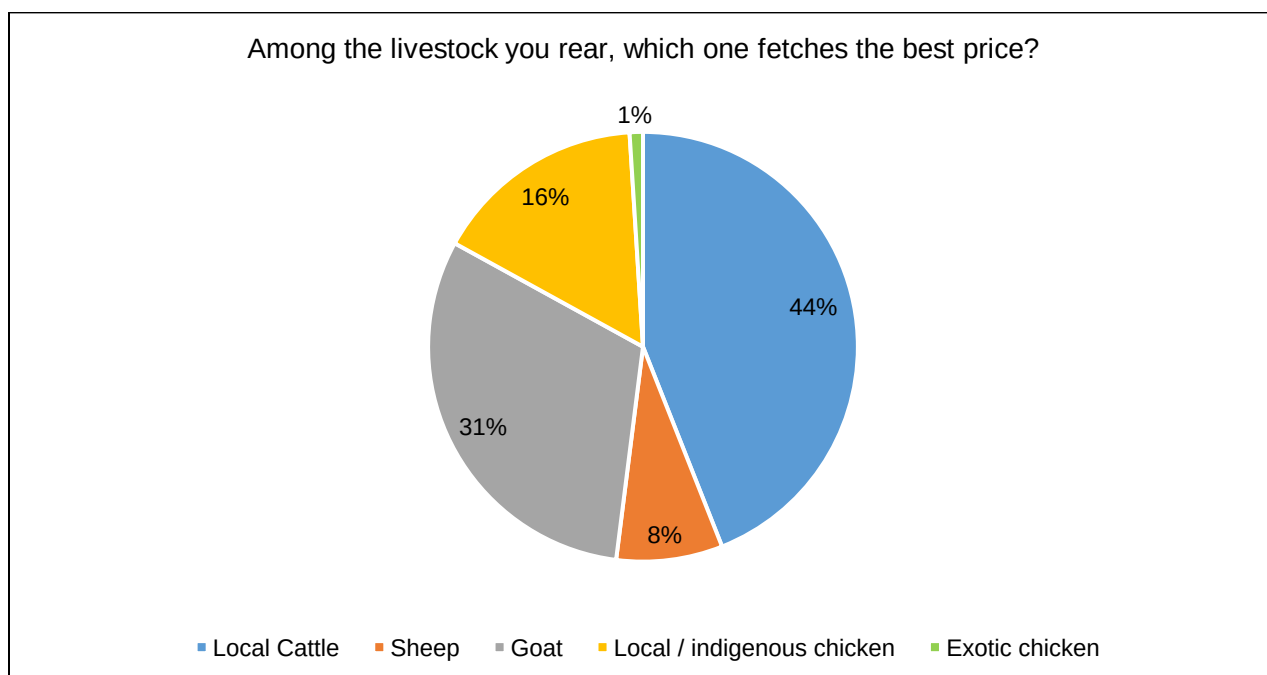
Crops and market prices fetched

Among the crops farmed in the county, groundnuts fetched the best prices in the market followed by sorghum. Most farmers fetched between SSP 10,000 and SSP 1500 per 90kg bag of Groundnuts, between SSP 1000 to SSP 2000 per 90 kg bag of sorghum and between SSP 1500 per 5 kg of Sesame.



Livestock and market prices.

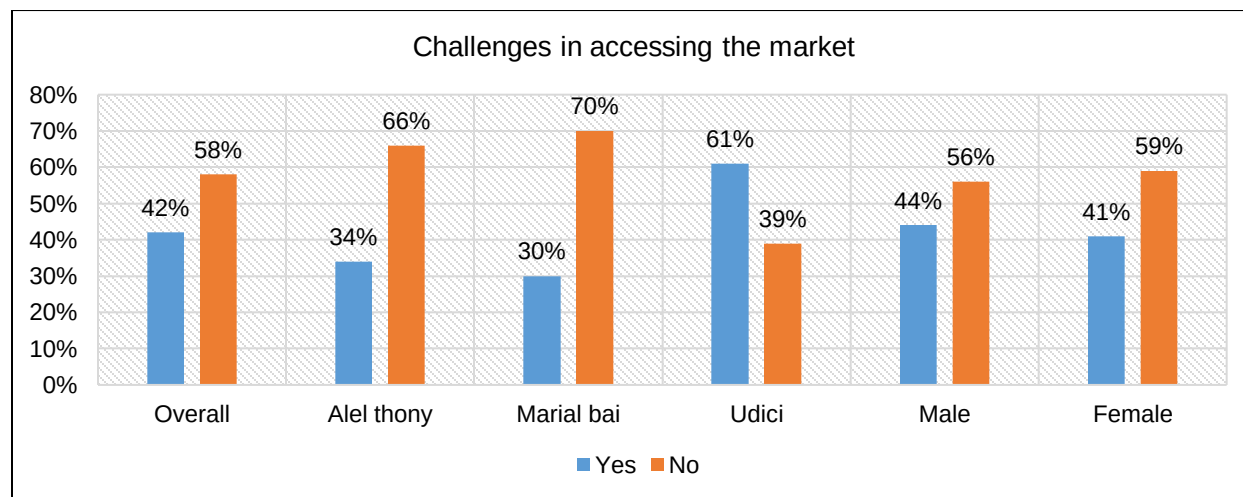
Local cattle (44%) fetched the best prices among other livestock in the county. Goats, indigenous chicken and sheep followed in that order. Most farmers in the county fetched SSP between SSP 70,000 to SSP 150,000 per cattle, between SSP 12,000 to SSP 15,000 per goat and between SSP 7,000 to SSP 10,000 per sheep. Indigenous chicken fetched between SSP 1000 and SSP 2000.



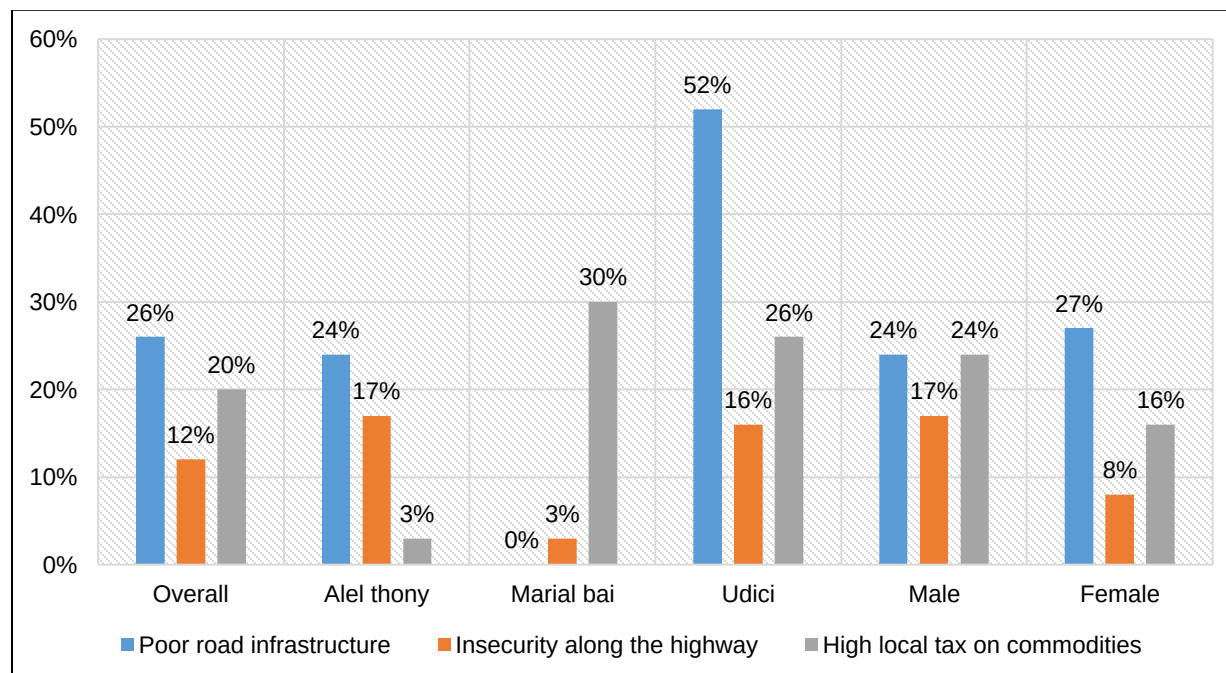
Challenges in accessing the market

Most of the farmers in this county did not have challenges accessing the market. Overall, 58% of the farmers interviewed acknowledged that they did not have challenges in accessing the markets. Across the payams, only Udici had most of the farmers interviewed having challenges

in accessing the market. More male farmers had challenges accessing the market compared to female farmers.



The main challenges faced in access to markets included; poor road infrastructure, high taxes on local commodities and insecurities along the highways. While Alel Thony payam faced the three challenges, the main challenge in Marial bai was tax on local commodities and farmers in Udici payam were most affected by poor infrastructure. These challenges were similar to both gender.



3.1.4 Twic County

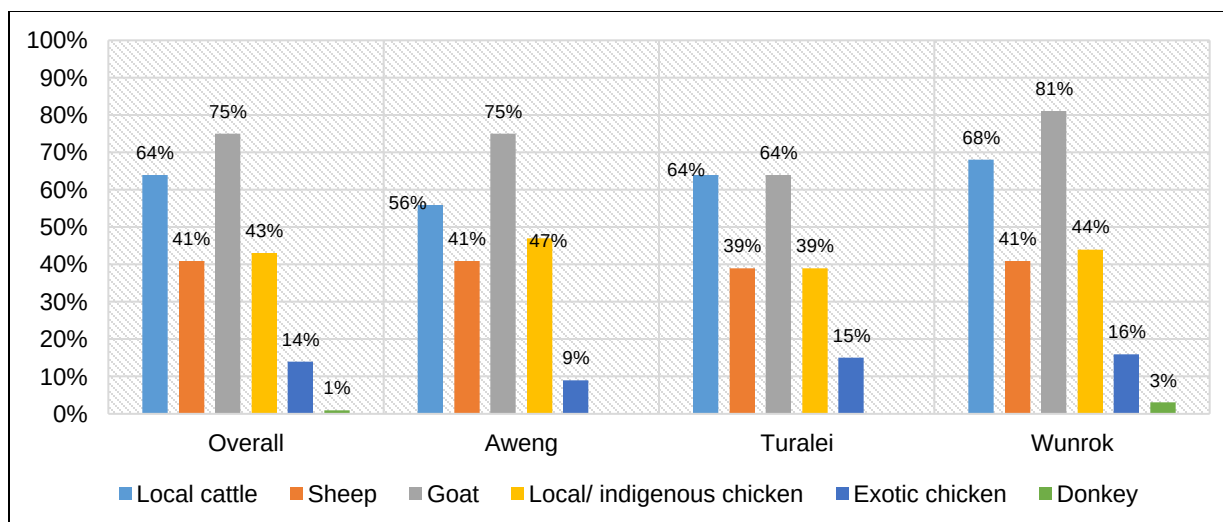
Socio-Demographic Characteristics

The table below shows the sociodemographic characteristics of the population of this survey. From the table, 83% were residents of the county, 13% returnees, 3% IDPs and 1% refugees. All respondents from Aweng Payam were residents and only Wunrok payam's sample included IDPs. Most (65%) respondents were female, were married, did not have formal education, were between 18 and 35 years and were heads of their households. The average household in the county was 8 members.

		Overall	Aweng	Turalei	Wunrok
Respondent categories	Resident	83%	100%	73%	81%
	IDP	3%	0%	0%	5%
	Returnee	13%	0%	27%	12%
	Refugee	1%	0%	0%	1%
Gender	Male	35%	66%	15%	30%
	Female	65%	34%	85%	70%
Marital status	Married	80%	91%	79%	77%
	Single	10%	0%	6%	16%
	Divorced/separated	3%	3%	0%	4%
	Widowed	7%	6%	15%	3%
Age (Years)	18-35	56%	38%	52%	66%
	36-45	30%	31%	24%	32%
	46-60	14%	31%	24%	3%
Average Household Size		8	8	8	8
Gender of household members	Male	4	4	3	4
	Female	4	4	5	4
Household Headship	Head of household	61%	88%	67%	47%
	Non household head	39%	13%	33%	53%
What is the highest level of your formal education	Not educated	70%	69%	82%	64%
	Primary school	19%	25%	12%	19%
	Secondary school	11%	6%	6%	15%
	College Diploma/ Degree	1%	0%	0%	1%

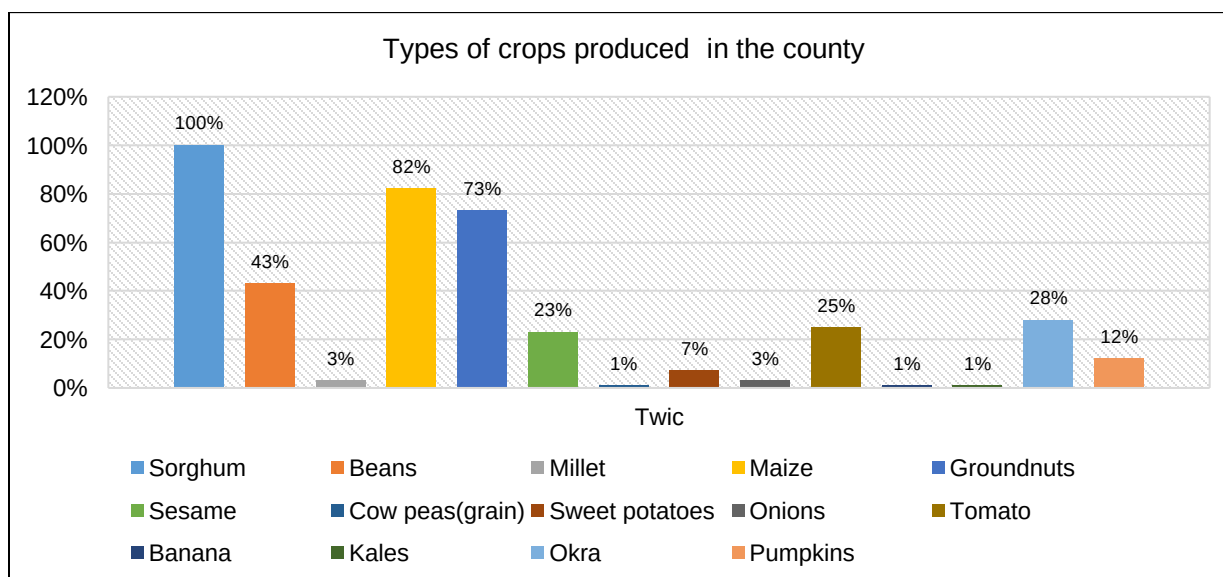
Livestock Production

The main livestock reared in Twic county were goats (reared by 75%), followed by local cattle (reared by 64%), local/indigenous chicken (reared by 43%) and sheep reared by 41% of all the respondents. This trend was similar across all the payams. Donkeys were only reared by farmers in Wunrok payam.

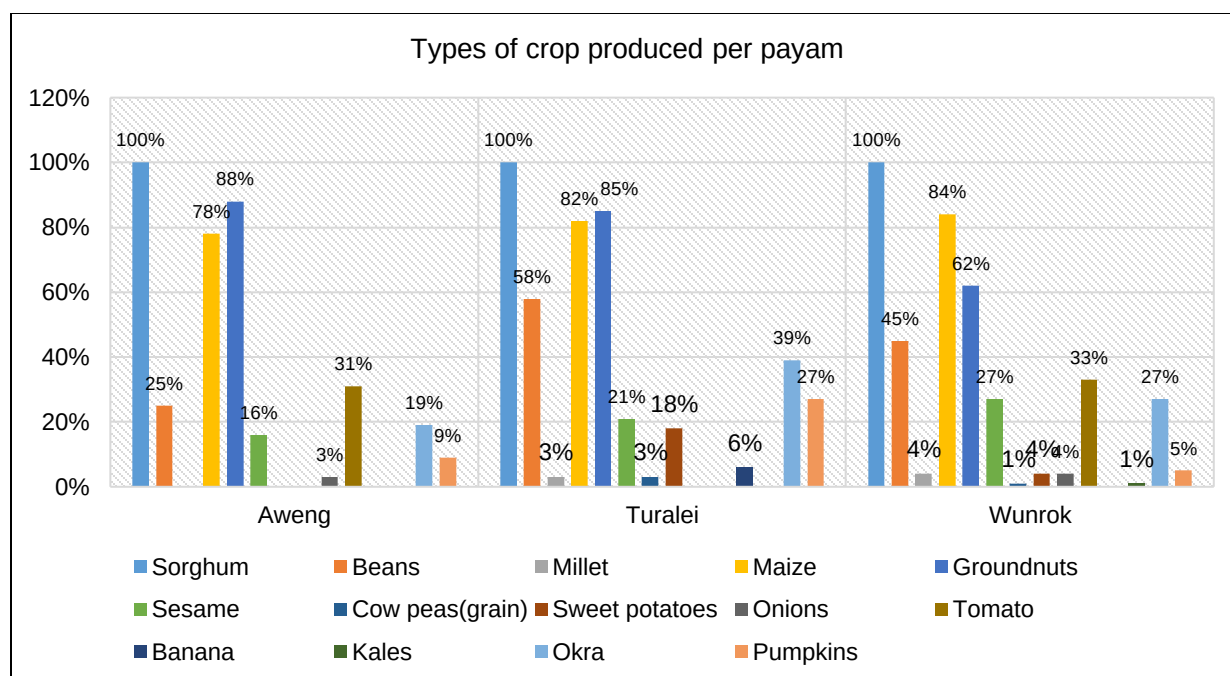


Crop Production

All farmers surveyed in this county produced sorghum. The second most produced crop was maize followed by groundnuts. Other crops produced across the three payams included beans, okra, sesame and pumpkins as shown in the chart below. This trend was similar for both male and female farmers.

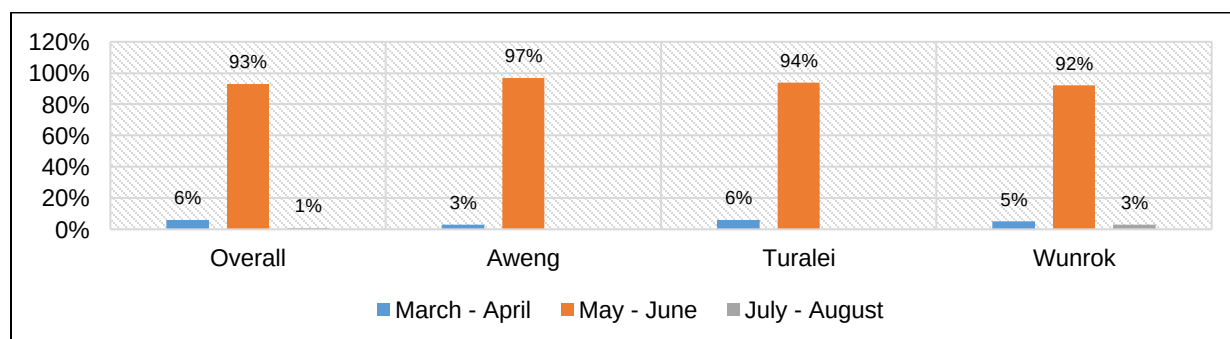


The chart below shows types of crops produced per payam. More crops were farmed in Wunrok payam compared to other payams.



Crop Planting Seasons

The county had one main crop planting season which occurred between May and June. Most farmers (93%) planted their crops during this season and only 6% planted their crops during the March to April season. The Chart below shows crop planting seasons in the county.



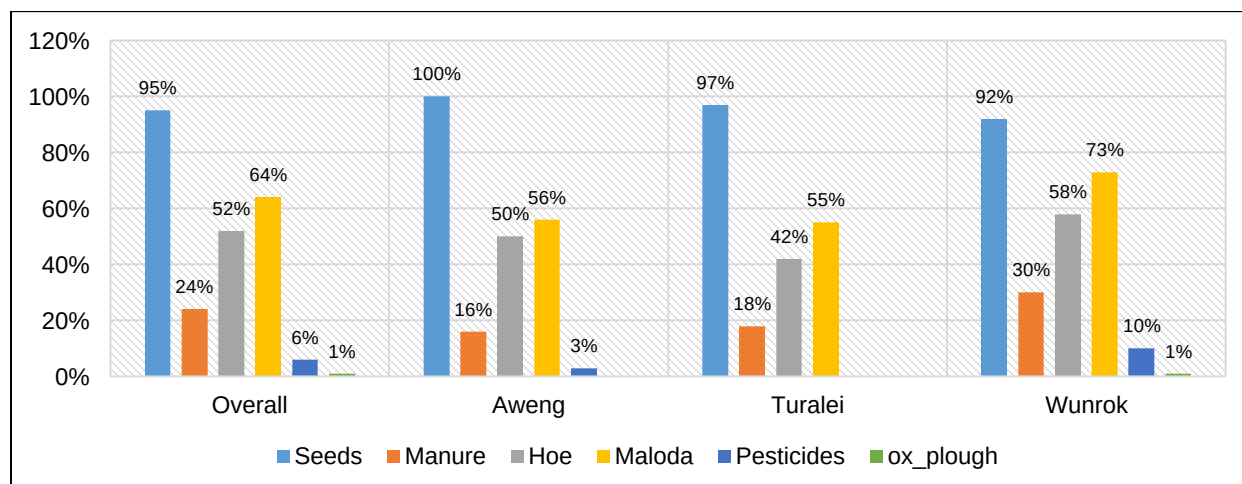
Size of Land Cultivated

The average size of land under crop farming in a year was 2.8 feddans per farmer. Among the three payams, Wunrok had the least size of land under crops. Male farmers farmed larger sizes of land compared to female farmers.

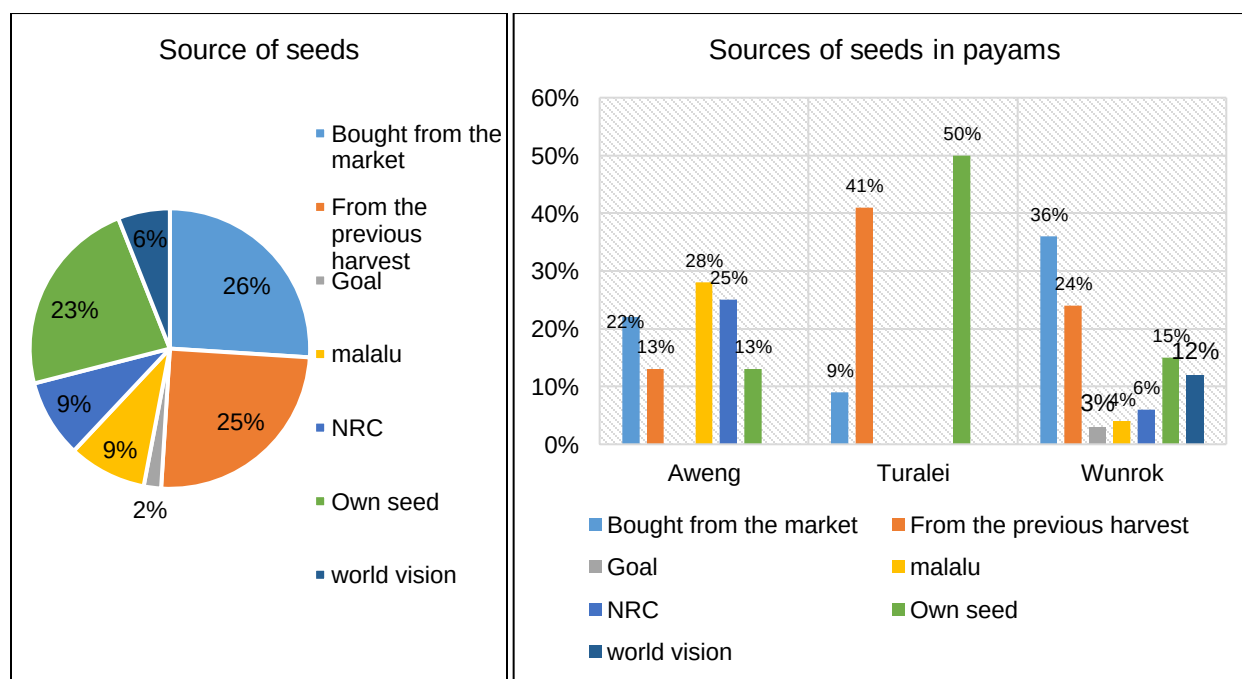
	Overall	Aweng	Turalei	Wunrok	Male	Female
Average size of land planted in a year (Feddans)	2.8	3.2	3.2	2.3	3.1	2.6

Farm Inputs Used by Farmers

The main inputs used by farmers in the county were seeds, malodas, hoes and manure. These were used in all the payams. Ox plough was only used in Wunrok Payam and only by 1% of the farmers in the Payam. On the other hand, pesticides were only used in Wunrok and Aweng payams. Manure was mainly made by farmers at the household level while malodas, hoes and pesticides were mainly bought from the market. Notably, 38% of farmers had accessed pesticides from World Vision.

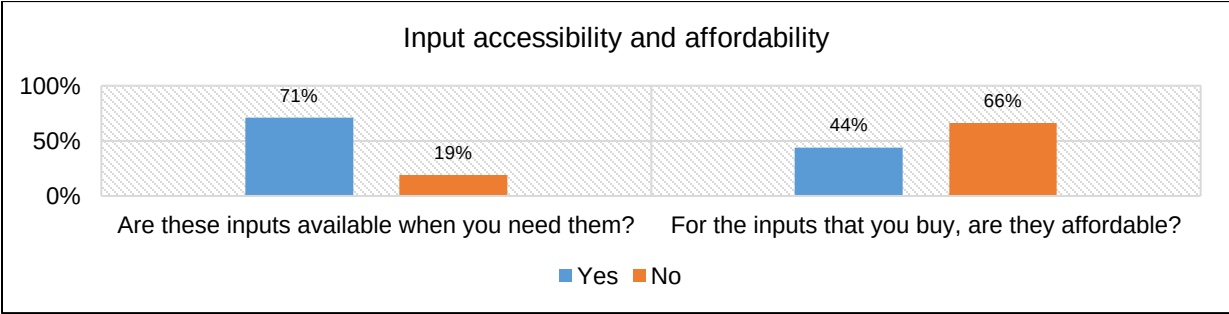


Overall, most of the farmers used 2 kilograms of seeds per feddan. The main source of seeds in the county was purchase from the market, seed from previous harvest and own seeds. The trend was similar across the payam. Notably, only farmers from Wunrok Payam had accessed seeds from World Vision.

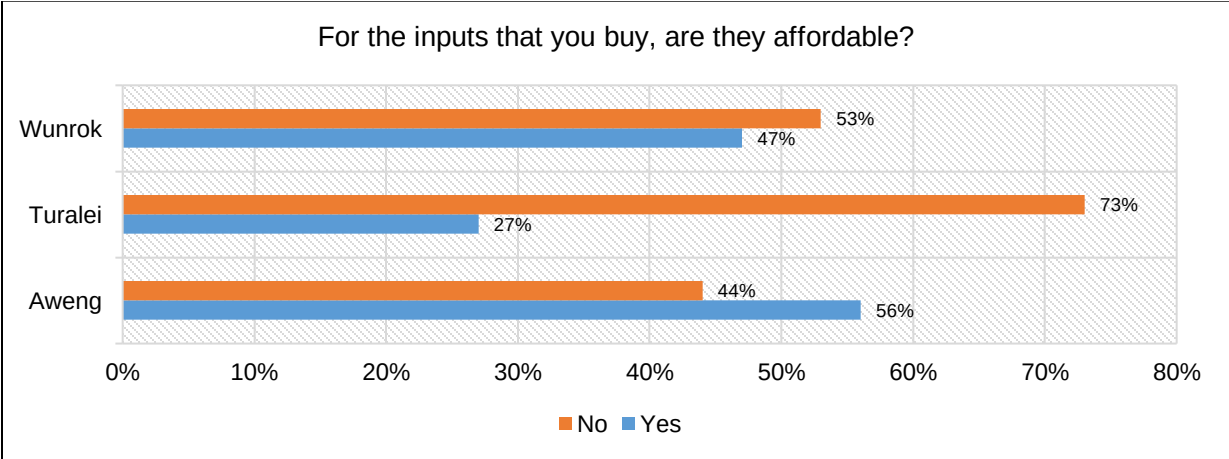


Input Accessibility and Affordability

Inputs were readily available to 71% of farmers in the county. Aweng payam had the highest access to inputs as 81% cited the inputs were readily available while in Turalei payam, only 61% had ready access to inputs. Notably, only 44% of the farmers thought the inputs were affordable. Similarly, to accessibility, farmers in most farmers (56%) in Aweng Payam felt the inputs were affordable while only 27% of farmers in Turalei echoed similar sentiments.

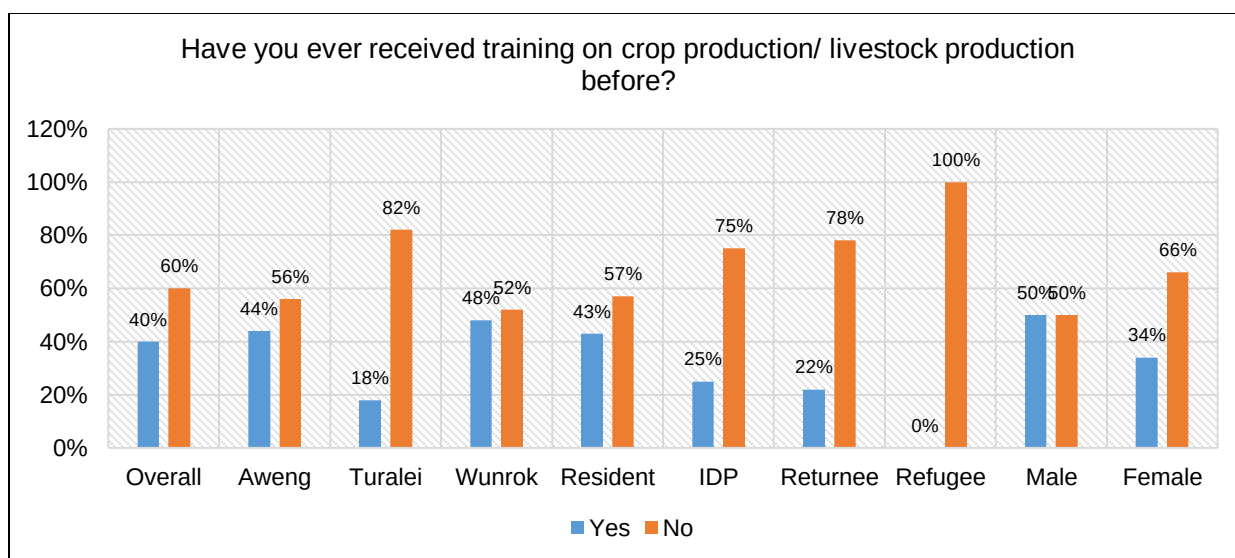


Affordability by Payam was as shown below.

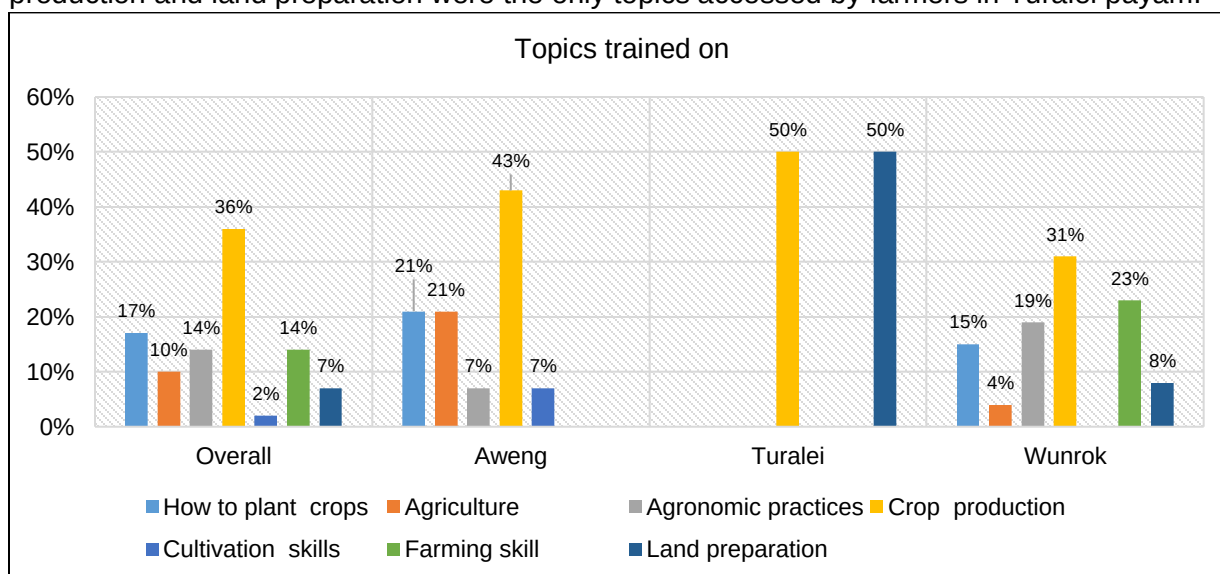


Training on Crop Production/ Livestock Production

Overall, only 40% of farmers in the county had been trained on crop production or livestock production. Half of the male farmers had been trained compared to only 34% of female farmers. Only 25% of IDPs, 22% of returnees and none of the refugees had been trained. Turalei payam had the least number of trained farmers as shown below.



Out of those who were trained, most (36%) were trained on crop production. Notably, crop production and land preparation were the only topics accessed by farmers in Turalei payam.



Source of Training

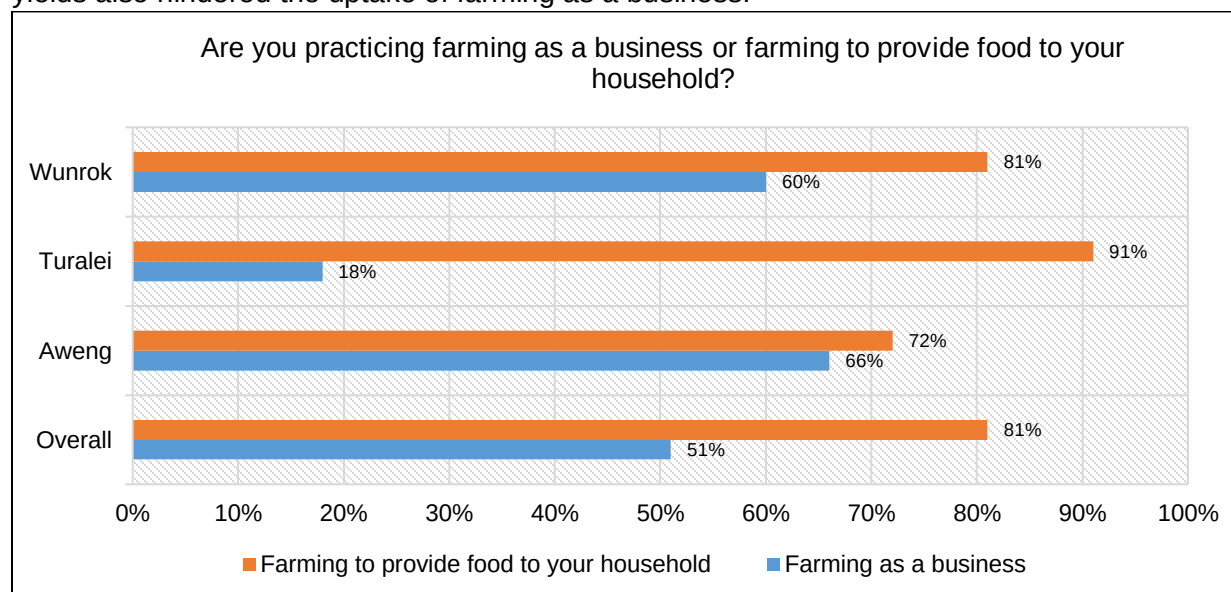
Most (45%) of the farmers received training from world Vision and NRC (45%). World vision provided training on How to plant crops, agriculture, agronomic practices, crop production, farming skills and land proportion. The table below shows the topics trained and the trainers. All the training accessed was done in an average of 3 days per topic.

	Overall	FAO	Goal	NRC	World vision
How to plant crops	17%	-	50%	21%	11%
Agriculture	10%	-	-	16%	5%
Agronomic practices	14%	100%	50%	5%	16%
Crop production	36%	-	-	42%	37%

Cultivation skills	2%	-	-	5%	-
Farming skill	14%	-	-	5%	21%
Land preparation	7%	-	-	5%	11%

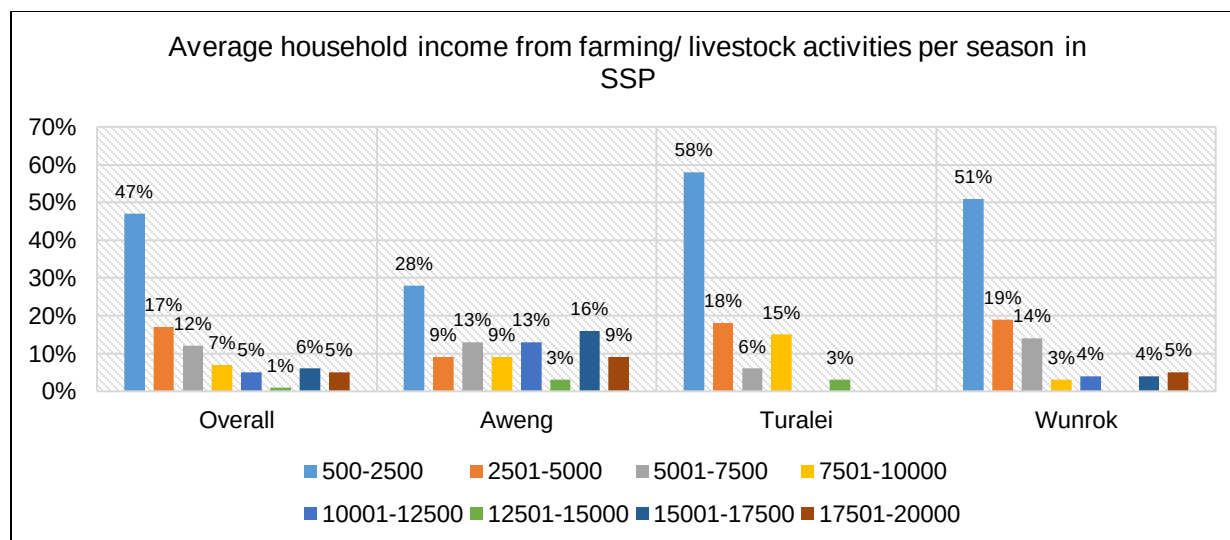
Farming and Business

Overall, 81% of the respondents in the county farmed to provide food for their household and 51% farmed as a business. Farming as a business was mainly done to generate income and while farming for food was due to food insecurity and also to provide access to inputs. Low yields also hindered the uptake of farming as a business.



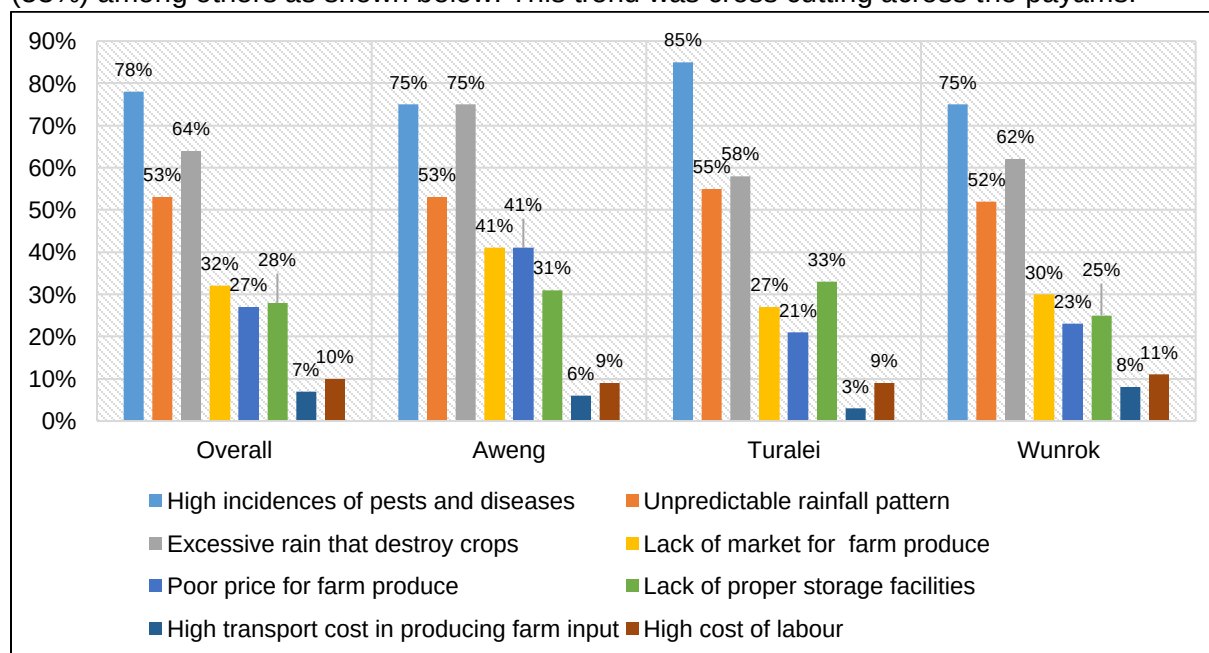
Household Income

Household income from crop farming and livestock activities per season for most farmers in the county (47%) earned between SSP 500 and SSP 2500 followed by 17% who earned between SSP 2,501 and SSP 5,000. Only 5% of the farmers earned the highest income of SSP 17,501 to SSP 20,000. None of the farmers in Turalei payam were in this category. Most of the male farmers (42%) and female farmers (50%) earned SSP 500 and SSP 2500.



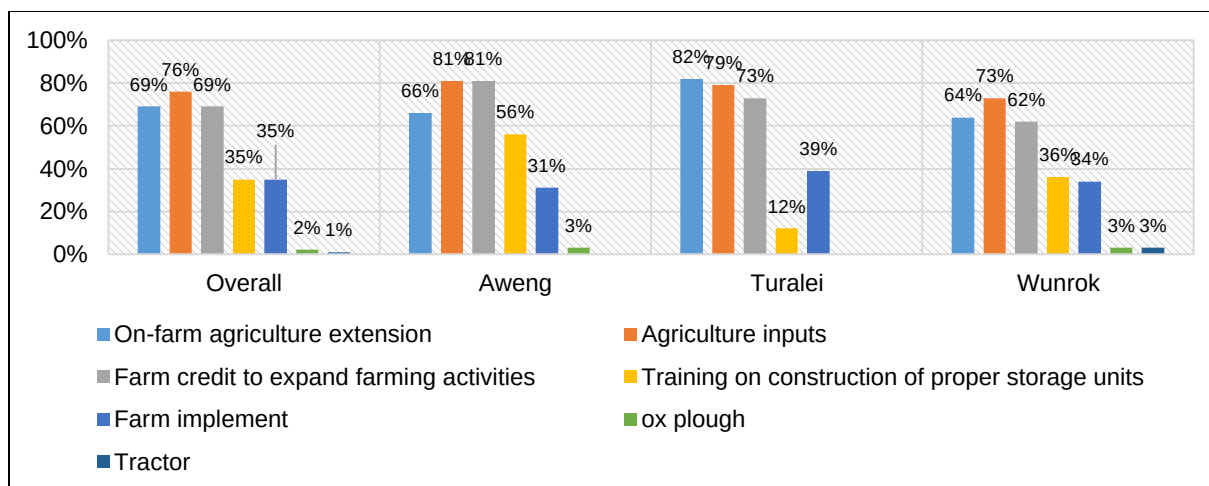
Challenges in Crop Farming

The main challenge faced by crop farmers in the county was high incidences of pests and diseases (78%) followed by excessive rain that destroyed crops (64%) and unpredictable rainfall (53%) among others as shown below. This trend was cross cutting across the payams.



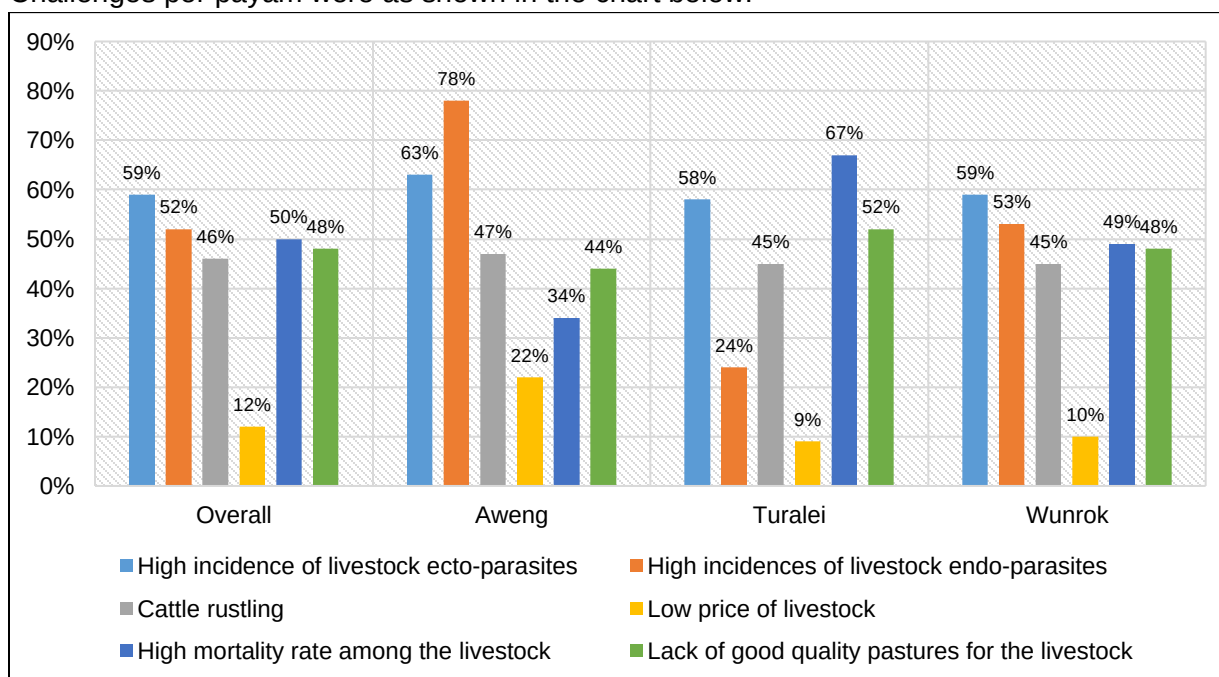
Technical Support Needed to Improve Crop Productivity and Production

The main technical support needed by farmers in the county was on agricultural inputs (76%), on-farm agriculture extension (69%) and farm credit to expand farming activities (69%). Others included farm implements, training on construction of proper storage units, ox ploughs and tractors as shown in the chart below.



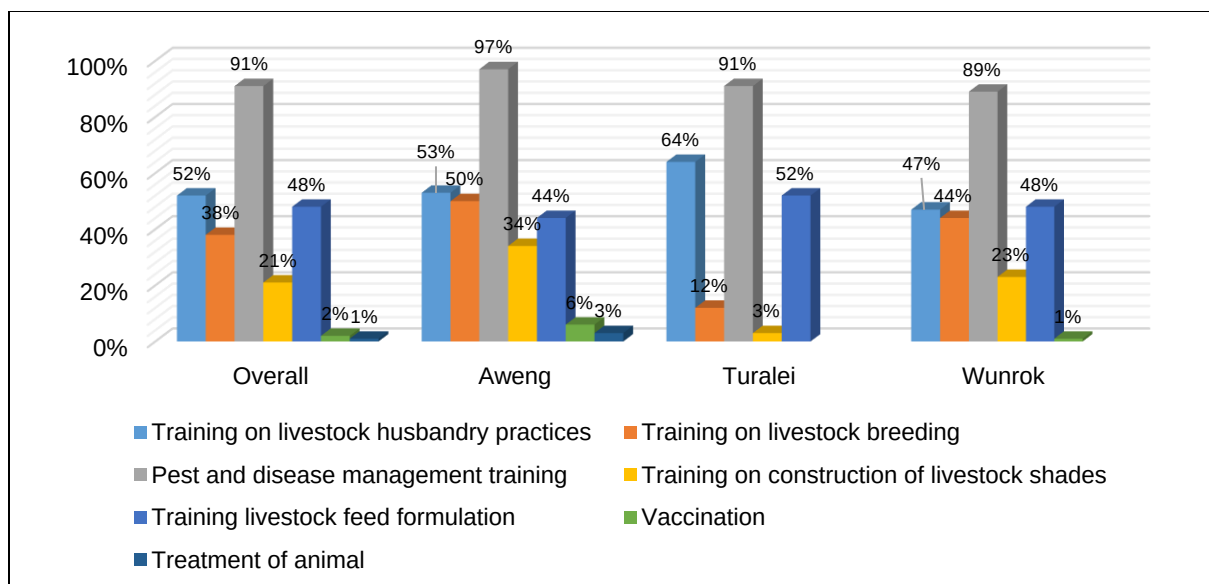
Challenges in Livestock Production

The main challenge in livestock production in the county included high incidences of livestock ecto-parasites and endo parasites, high livestock mortality rates, lack of quality pastures, cattle rustling and low prices of livestock. Endo-parasites were more rampant in Aweng payam compared to Turalei and Wunrok payams where ecto-parasites were a bigger challenge. Challenges per payam were as shown in the chart below.



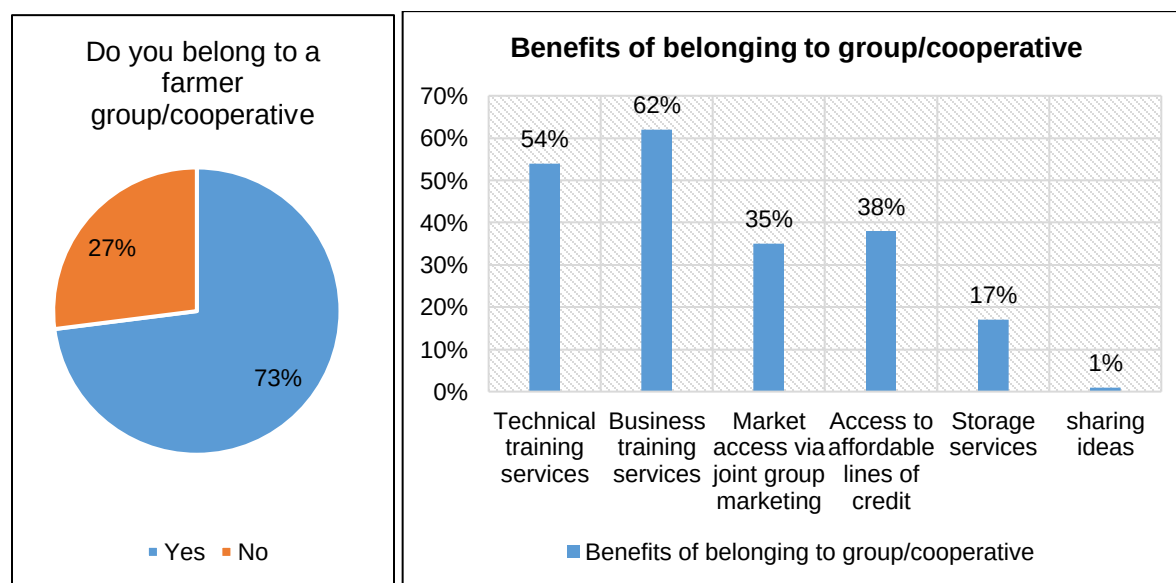
Technical Support Needed to Improve Livestock Production

To address the challenges identified above, farmers required support in form of pest and disease management (91%), training on livestock husbandry practices (52%) and livestock breeding feed formulation (48%) among others as shown in the chart below. This trend was synonymous across the payams.



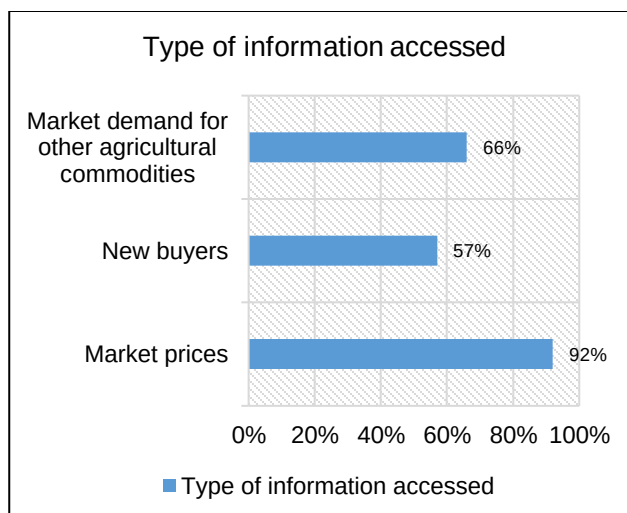
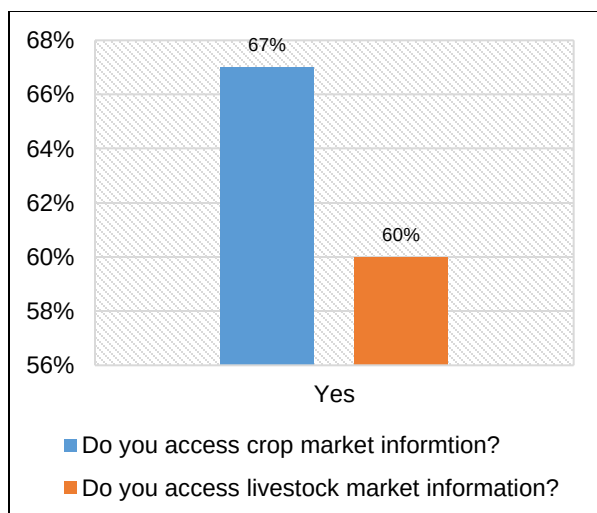
Farmer Group/ Cooperative Membership

Membership to cooperatives and farmer groups was high as 73% of the respondents in this county belonged to groups/cooperatives. The main benefits associated with membership to groups/cooperatives included business training services, technical training, access to market through joint marketing and access to affordable lines of credit among others as shown below.



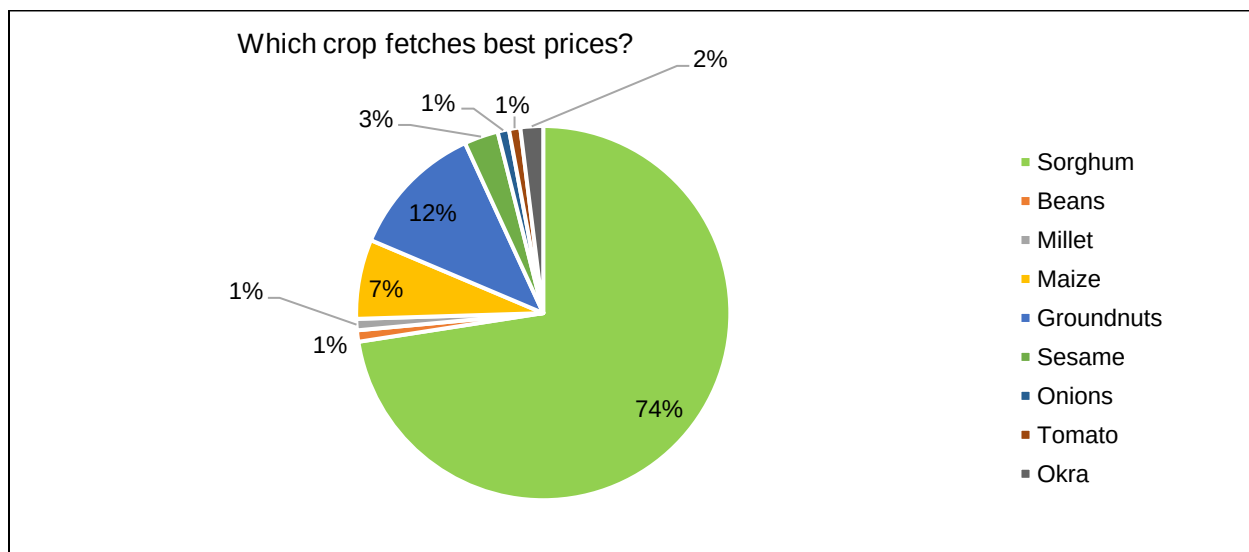
Access to Market Information

Overall, 67% of farmers in the county had access to crop market information and 60% accessed livestock market information. The main type of information accessed is market prices (accessed by 92%), market demand (accessed by 66%) and information on new buyers (accessed by 57%).



Crops and Market Prices Fetched

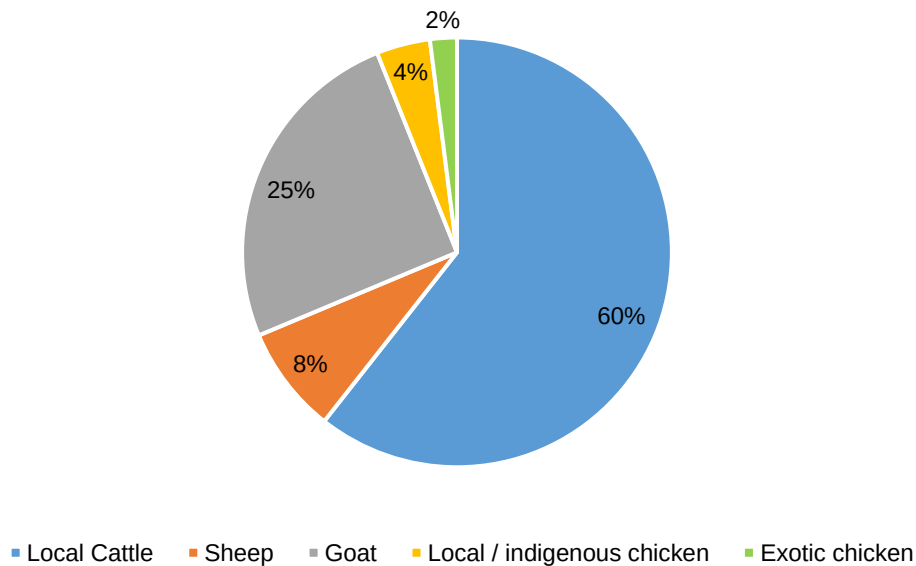
Among the crops farmed in the county, sorghum fetched the best prices in the market followed by groundnuts and maize. Most farmers fetched between SSP 2000 to SSP 3000 per 90kg bag of sorghum, SSP 15000 per 90 kg bag of groundnuts and SSP 2,130 per 90 kg bag of Maize.



Livestock and Market Prices.

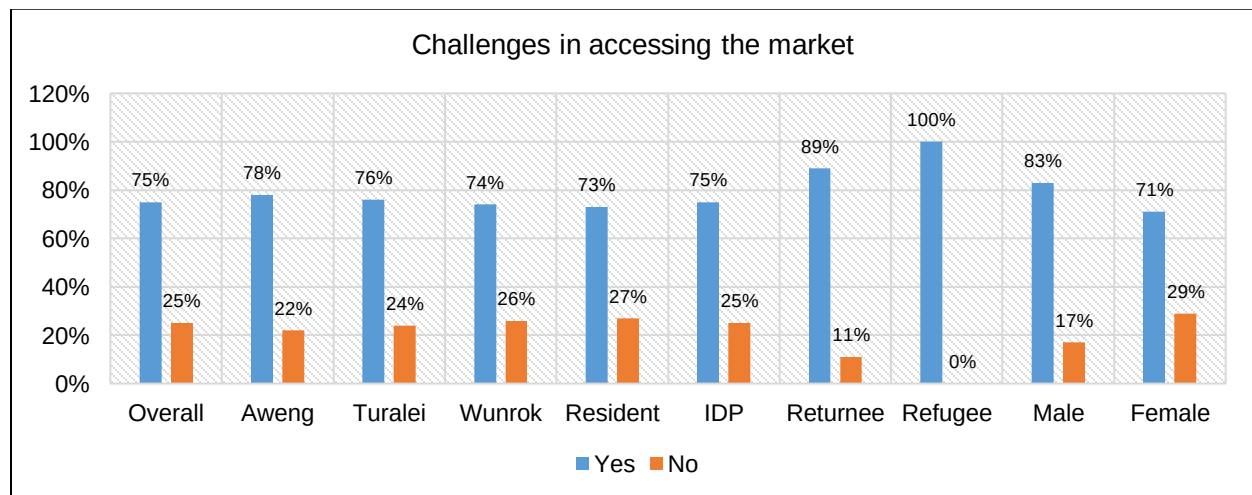
Most farmers (60%) cited local cattle as the livestock that fetched best prices in the markets followed by goat and sheep. Most farmers in the county fetched SSP 80,000 per cattle, SSP 7,000 per sheep and SSP 7,000 per goat. Exotic chicken fetched SSP 1,000 while indigenous chicken fetched between SSP 300 and SSP 1,000.

Among the livestock you rear, which one fetches the best price?

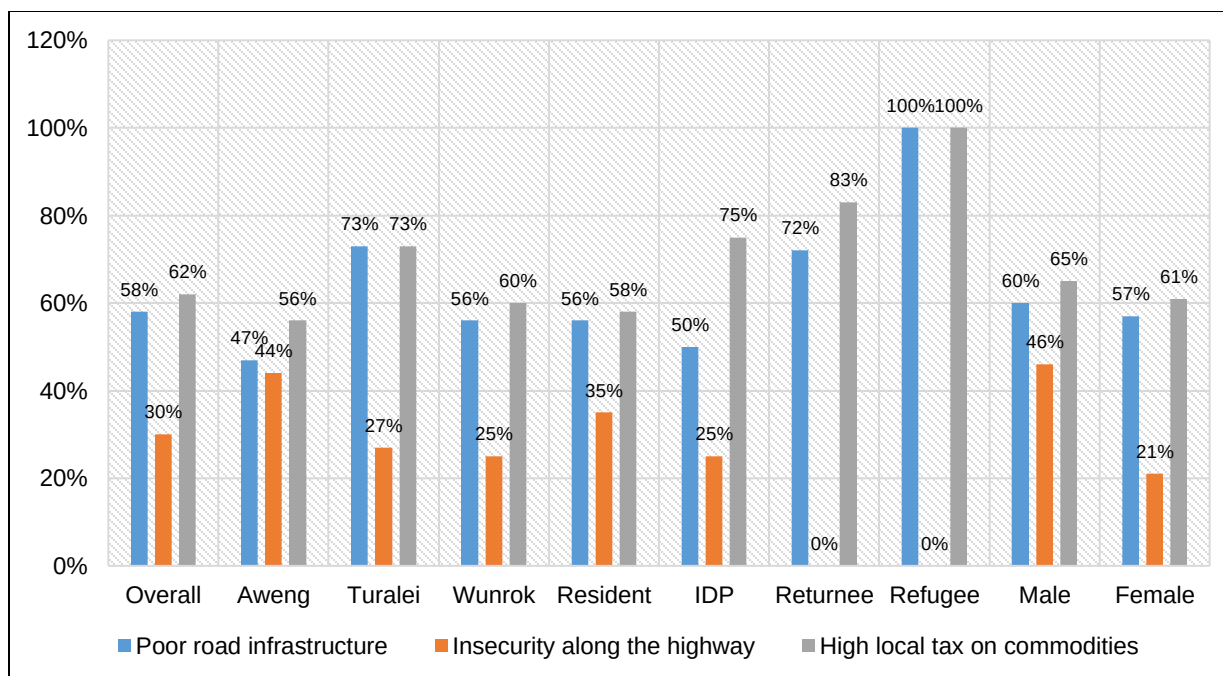


Challenges in Accessing the Market

Overall, 75% of the farmers interviewed acknowledged having challenges in accessing the markets. More returnees and all refugees had difficulties accessing the markets compared to residents and IDPs.



The main challenges faced in access to markets are high taxes on local commodities, poor road infrastructure and insecurities along the highways. These challenges were similar to both gender. Noteworthy, returnees and refugees' main challenges were poor road infrastructure and high local taxes.



3.2 Market Systems and Local Value Chains Assessment Results

3.2.1 Traders Assessment

All Respondents

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Jur river	8	8	0	0	0
	27%	100%	0%	0%	
Twic	7	0	7	0	0
	23%	0%	100%	0%	
Gogrial East	8	0	0	8	0
	27%	0%	0%	100%	
Cueibet	7	0	0	0	7
	23%	0%	0%	0%	100%

A total of 30 randomly selected agricultural commodity traders were interviewed by the consultant in the project locations as show above. 8 traders were interviewed in Jur River, 7 in Twic, 8 in Gogrial East and 7 in Cueibet Counties.

Categories of Traders

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Wholesaler	4	0	2	0	2
	13%	0%	29%	0%	29%
Retailer	23	5	5	8	5
	77%	63%	71%	100%	71%
Produce to sale	5	3	0	0	2
	16%	38%	0%	0%	29%

Overall, 13% of the traders interviewed were wholesaler, 77% retailers while 16% were producers who also sell what they produce in the market.

Business Registration/ Legal

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Yes	10	4	1	5	3
	33%	50%	14%	63%	43%
No	20	4	6	3	4
	67%	50%	86%	37%	57%

Overall, 33% of the businesses are legally registered while 67% are not legally registered.

Level of Education

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Not educated	15	7	4	4	3
	65%	88%	57%	50%	43%
Primary education	4	1	1	2	4
	17%	13%	14%	25%	57%
Secondary/ high school education	4	0	2	2	0
	17%	0%	29%	25%	0%

Most business people in the 4 counties Are not educated. Jur River has the highest number of businesses people not educated (88%) followed by Twic County (57%) and Gogrial East (50%). Additionally, over 85% of the traders operate daily in the open-air markets.

Type of Business Engaged in

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Butchery	3	2	0	1	0
	13%	25%	0%	13%	0%
Cattle selling business	4	2	2	0	2
	17%	25%	29%	0%	29%
Fish selling business	2	0	2	0	2
	9%	0%	29%	0%	29%
Sorghum selling	9	4	1	4	1
	39%	50%	14%	50%	14%
Maize selling business	5	1	1	3	1
	22%	13%	14%	38%	14%
Groundnut selling business	8	3	1	4	1
	35%	38%	14%	50%	14%
Vegetable selling business	2	1	1	0	1
	9%	13%	14%	0%	14%
Okra	1	1	0	0	0
	4%	13%	0%	0%	0%
Goat selling business	2	0	2	0	2
	9%	0%	29%	0%	29%
Sheep selling business	1	0	1	0	1
	4%	0%	14%	0%	14%
Fried Tea selling	1	0	0	1	0
	4%	0%	0%	13%	0%
Goods	1	0	1	0	1
	4%	0%	14%	0%	14%
Tea making	2	1	1	0	1
	9%	13%	14%	0%	14%
Sugar Salt Wheat	1	0	1	0	1
	4%	0%	14%	0%	14%
Maize flour Sugar Loan service	1	0	0	1	0
	4%	0%	0%	13%	0%
Shop bar	1	0	0	1	0
	4%	0%	0%	13%	0%
Cassava	1	0	0	1	0

	4%	0%	0%	13%	0%

Overall, most traders engaged in sorghum (39%), groundnut (35%) and maize (22%) selling in the main market centers in Jur River, Twic, Gogrial East Counties.

Value Addition by Traders (Do you add value to the commodity that you sell?)

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Yes	10	3	2	3	2
	33%	38%	29%	38%	29%
No	20	5	5	5	5
	67%	63%	71%	63%	71%

Overall, as shown above only 33% of the traders interviewed add value to the commodities they. Value addition takes place in the form of sorting, drying, grading and packaging.

Are there Regulations Relating to Product Quality?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Yes	14	3	4	7	5
	47%	38%	57%	88%	71%
No	16	5	3	1	2
	53%	63%	43%	13%	29%

In Jur River County, 38% of the respondents said that there are regulations related to quality of the products, in Twic County 57%, in Gogrial East 88% and in Cueibet 71%. The regulations mainly center on hygiene of premises (86%) and product expiry (36%).

Where do you Buy the Products that You Sell?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Local county market	14	2	6	1	5
	47%	25%	86%	13%	71%
State markets	10	4	1	5	0
	33%	50%	14%	63%	0%
Barter trade markets	1	0	1	0	0

	3%	0%	14%	0%	0%
Buys directly from producers	9	3	0	4	2
	30%	38%	0%	50%	29%

Most trader buy the products that they sell from state market (33%) and from producers (30%).

What Made You Start the Business?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Demand for the product	12	5	4	1	2
	40%	63%	57%	13%	29%
Ready supply of inputs/ raw materials	7	0	3	2	2
	23%	0%	43%	25%	29%
No business here before	6	3	2	1	0
	26%	38%	29%	13%	0%
Availability of start-up capital	15	3	6	3	3
	50%	38%	86%	38%	43%
Pushed by other people to start	2	1	1	0	0
	9%	13%	14%	0%	0%
Willingly started it	1	0	0	1	0
	4%	0%	0%	13%	0%
To buy cow or food	1	0	0	1	0
	4%	0%	0%	13%	0%
Make person rich	1	0	0	1	0
	4%	0%	0%	13%	0%

Overall, the main reasons for starting businesses as cited by the traders are high demand for the product (40%), availability of start-up capital (50%), shortage of businesses in the respective counties (26%) and ready supply of raw materials (23%).

What Skills Do you think if acquired will help your business run profitably?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Business management skills	27	5	7	8	7
	90%	63%	100%	100%	100%
Farming skills	2	1	0	1	0
	9%	13%	0%	13%	0%
Marketing skills	4	2	0	2	0
	17%	25%	0%	25%	0%

Overall, over 90% of the traders stated that if they acquire business managed skills, their respective businesses will run profitably.

By How Much has your Business Improved Since You Started Operating?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Opened another branch	3	1	0	2	0
	13%	13%	0%	25%	0%
Increased stock	11	1	2	4	4
	37%	13%	29%	50%	57%
Increased customers	18	4	6	5	3
	60%	50%	86%	63%	43%
Increased employees	3	0	2	1	0
	13%	0%	29%	13%	0%
Increased profit	12	2	6	4	0
	52%	25%	86%	50%	0%

In Twic County, 86% of the business persons said that their business registered increased profit since they started operating attributed to increased customer base (86%). Respondents from Jur River (50%0, Gogrial East (63%) and Cueibet (43%) also registered increased customers.

What Do You Consider When Settling Prices of Your Commodities?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Demand of the product	12	6	2	2	2
	40%	75%	29%	25%	29%
Determined by the customer	6	1	3	2	0
	20%	13%	43%	25%	0%
Competitors' prices	12	3	3	1	5
	40%	38%	43%	13%	51%
Negotiation	6	1	4	1	0
	20%	13%	57%	13%	0%
Prices are set by the market association	8	1	3	4	0
	27%	13%	43%	50%	0%
I set the prices myself regardless	4	1	1	2	0
	13%	13%	14%	25%	0%

Overall, the prices of commodities are determined by demand (40%), competitor prices (40%), price set by the market association (27%), and negotiation (20%).

Where Did You Get the Money to Start Your Business?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Own saving	21	4	6	5	6
	70%	50%	86%	63%	86%
Given by relative	6	1	2	3	2
	20%	13%	29%	38%	29%
VSLA loan	2	0	1	0	1
	6%	0%	14%	0%	14%
Sales of Asset (specify):	5	4	0	1	0
	17%	50%	0%	13%	0%

Most traders obtained the money to start business from own saving as shown in the table above. Whereas the VSLA were found to exist in the project locations, most of them are at formative stages, therefore not yet ready to start offering loans.

What Challenges Do You Face in Running in Your Business?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Lack of customers	13	6	3	4	0
	43%	75%	43%	50%	0%
Seasonality in sales	15	4	4	5	2
	50%	50%	57%	63%	29%
Product stock-out due to delayed supply	7	1	4	2	0
	23%	13%	57%	25%	0%
Informal fees and taxes	7	3	3	1	2
	23%	38%	43%	13%	29%
High license fee	9	3	3	3	0
	30%	38%	43%	38%	0%
High prices	1	0	0	1	0
	3%	0%	0%	13%	0%
Transport Storage	4	0	0	1	3
	13%	0%	0%	13%	43%
Family expenditure	1	0	0	1	0
	4%	0%	0%	13%	0%
lack or limited produce	1	0	0	1	0
	4%	0%	0%	13%	0%

Overall, the major challenges experienced by the traders in the course of running their businesses are seasonality in sales (50%), lack of customers during pick season due to oversupply of products in the market (43%), and high license fees in the market (30%).

Possible Solution to Reduce the Challenges Identified Above?

	Total	Jur river	Twic	Gogrial East	Cueibet
Total	30	8	7	8	7
Reduce trade license	11	3	3	3	2
	37%	38%	43%	38%	29%
End informal fees and taxes	8	3	2	1	2
	27%	38%	29%	13%	29%
Conduct more marketing of the products	13	5	5	3	0
	43%	63%	71%	38%	0%
More capital to increase the stocks	18	4	5	6	3
	60%	50%	71%	75%	43%
Training on business concepts.	1	0	0	1	0
	3%	0%	0%	13%	0%
Increase farm products.	1	0	0	1	0
	3%	0%	0%	13%	0%

Overall, most traders recommended that the trade license fee ought to be reduced (37%), end informal fees and taxes (27%), conduct more marketing of the product (43%) and avail more capital to increase stocks (60%).

3.2.2 Assessment of market systems

- State of the market infrastructure (state of the roads and distance to the markets, mobile telephone networks, market facilities: stalls, display table, sanitary conditions:

Qualitative Market Systems Analysis, Cueibet County:

Roads to and from the Cueibet market: Cueibet County is composed of two main roads connecting the market. The Rumbek-Cueibet Road that connects the central Rumbek North County with Cueibet. This road plays a paramount role in ensuring transport of agricultural commodities from Rumbek to Cueibet. It takes approximately 2.5 hours to travel from Rumbek to Cueibet: given the occasional insecurity situation experienced in Cueibet, the road is instrumental for transportation of vital commodities from Rumbek to Cueibet.

Whereas as the road play a crucial role, it is not tarmacked, dilapidated and rendered almost impassable during rainy season. The Cueibet-Tonj-Aweil Road is another major road the links Cueibet to outside markets that is responsible for supply shipment to Cueibet market during off-season periods. This road is also almost impassable during rainy season due to flooding.

While the two roads play an important role, certain sections along the road do not have mobile telephone network; this jeopardizes security and access to timely and accurate market

information. Assessment through interviews with market traders in the market in Cueibet also reveal that during off-production period most agricultural commodities are imported into Cueibet from Rumbek and Tonj direction.

Market Infrastructure/ Facilities in Cueibet County: There are limited formal/ permanent market structure seen in the main market center in Cueibet County. The market center is informally constructed with many stalls made from worn-out tarpaulin, torn mats and in some cases thatched bamboo structures. Some traders display their agricultural commodities (grains in basins, buckets and tins, and vegetables on raised wooden structure in the “open-air” market. The market infrastructure is very basic similar to what would be seen in a refugee setting. Further traders lack proper storage facilities; in the evening, most traders have to carry along their commodities to their respective residences.

Water and sanitary Condition: No proper water supply system is seen in the market. Equally missing is proper sewage system; no wash rooms are seen. During rainy season, the market is flooded with water due to poor drainage system. This present health hazard. County official are mainly concerned with collection of market fees and taxes.

Traders Arrangement/ Locations: There are some formal arrangement of traders in the market. Grain traders are found on one side of the market, vegetable traders on another side, artisanal millers in a separate location. Traders are in dire need of standard stalls and display tables.

Market Structure, Taxes and Market Fees: The market structure is composed of agricultural commodity retailers and smallholder farmers. There is limited constellation of marketing channels. Traders pay a monthly market tax of SSP500 and daily market fees of SSP50.

Financial Service Providers: There are no formal financial service providers, no banks and no formal agricultural financing institutions. Informal lending mechanisms exist where borrowers would borrow from individual at an agreed interest rate. New lending mechanisms, the VSLAs, exist courtesy of catalytic actions by the non-governmental organisations.

Rules and regulations exiting in the markets in the priority locations: Nor formal business registration system exist for petty traders/ retailer although the wholesalers are required to register with the county municipal council. Markets are open early in the morning are close by 6 o'clock in the evening. The markets remain closed during periods of skirmishes/ insecurity.

Causes of Market Failure: Whereas marketing activities are taking place in the markets in Cueibet, these activities are mainly retailing in nature. The lack of proper market infrastructure, poor road network, lack of proper storage facilities and insecurity is impeding the growth and development of the market. The market as largely failed to attract external investment especially given the poor road, seasonal flooding and insecurity. However, local small-scale processors are emerging in the market, but they mainly offer processing services. Whereas free issuance of seeds and farm tools has helped promote agricultural production in Cueibet, the long term result is that it prevents the development of agricultural input business in the market.

Existing Market Opportunities: The demand for sorghum is quiet high in Cueibet County. Local production is not able to meet the demand. Subsequently, sorghum is imported into Cueibet from other Counties during off-production periods. There are opportunities to increase acres of

land under production given the fact that the soil is fertile. There are also opportunities to upscale VSLA activities to provide affordable credit to the farmers in the county.

S.W.O.T Analysis:

Strength of the Market System: The county has fertile land and enough rainfall suitable for production of various cereal and vegetable crops.

Weakness of the Market System: There is poor and dilapidated road that impede movement of agricultural commodities to the market. Further, the poor communication network in at the payam level prevent transmission of crucial and accurate market information in a timely manner.

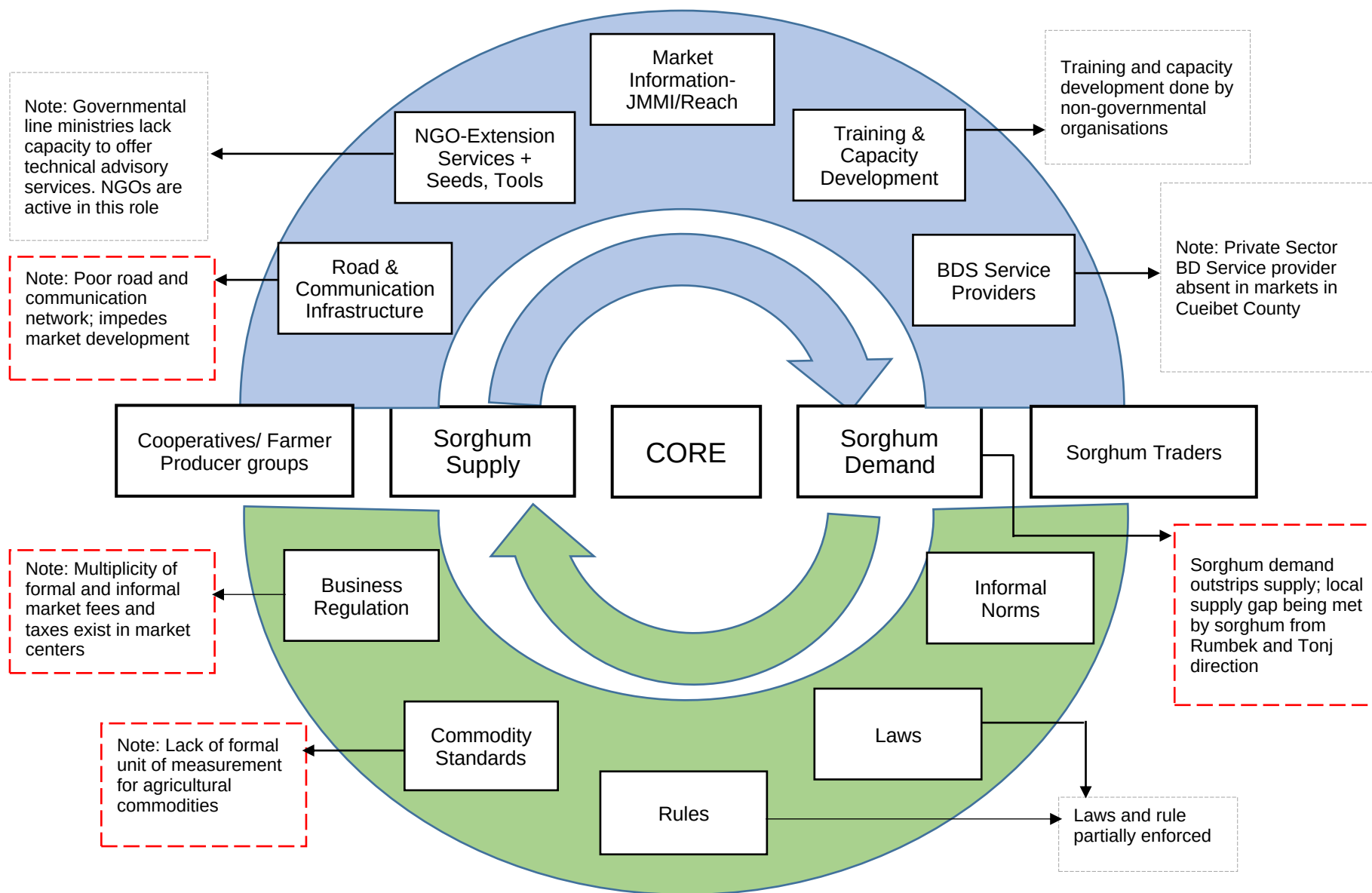
Opportunities Existing in the Market System: Opportunity exist for production of high income crops such as groundnut and maize. There are opportunities for value-addition of produce to fetch better market prices.

Threats: The Insecurity situation in the county exacerbated by high number of weapon in the civilian hands negates market development, investment and agricultural commercialization.

Areas for MSME Entrepreneurial Development and Growth: Sorghum production, value addition and marketing, maize production, value addition and marketing, groundnut production value addition and marketing, upgrade emerging MSME agri-processing industry in the market and promote the development of local indigenous-owned VSLAs

Solutions to Improve Business Environment: Improve on the road infrastructure and mobile telephone network (long-term), introduce community-based seed production to avail high quality seeds to farmers, support construction and establishment of standard stalls, storage facilities, water and sanitation units and drainage canals.

3.2.3 Market System Map for Sorghum Sub-Sector



3.2.4 Initial Value Chain/ Sub-Sector Selection System

BASED ON OPINION OF KEY PERSONS AND RAPID SCANNING OF THE MARKET CENTERS TO DETERMINE POPULARITY OF AGRICULTURAL COMMODITIES IN CUEIBET, GOGRIAL EAST, JUR RIVER AND TWIC COUNTIES.

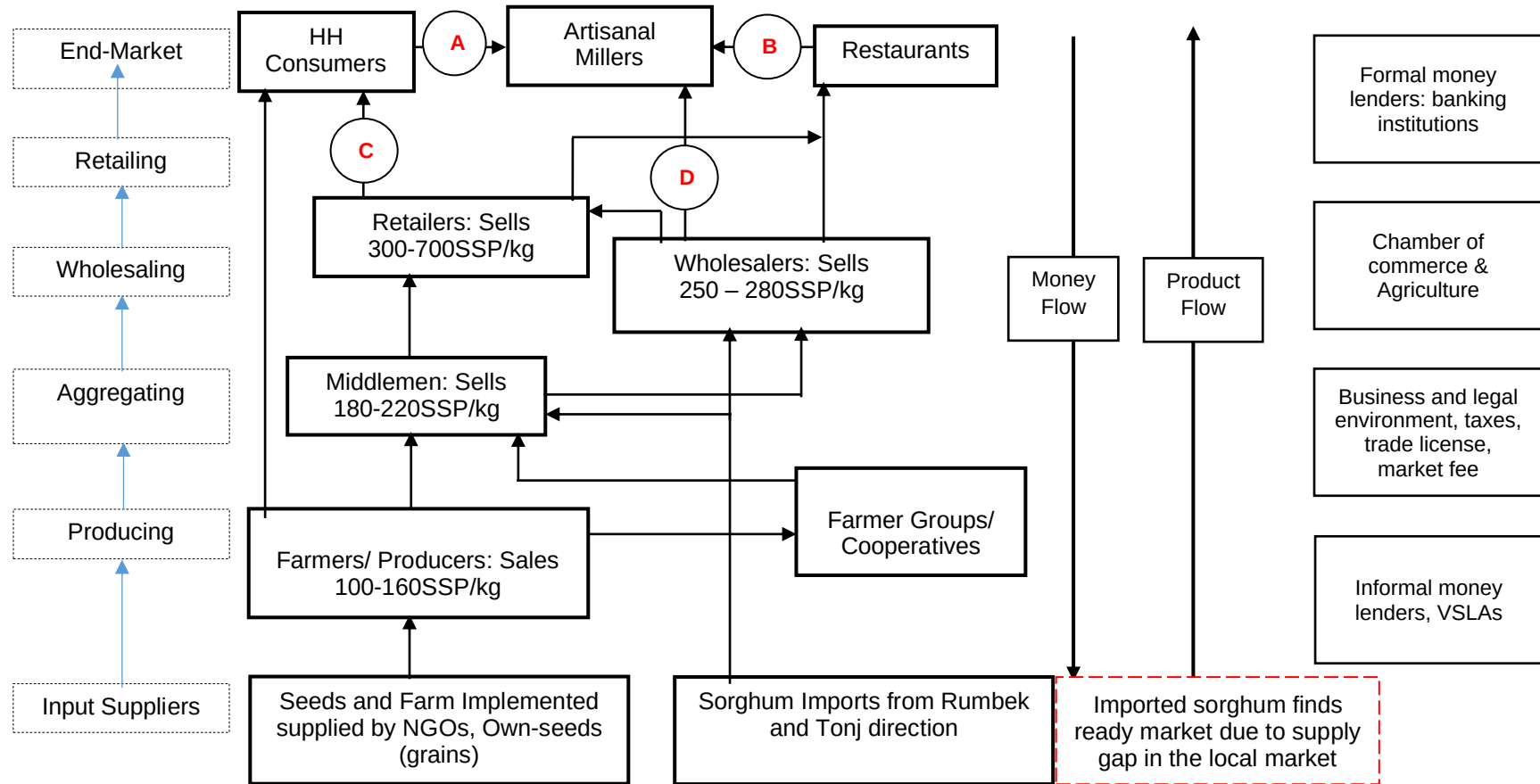
Selection Benchmark	SO	MI	MA	SE	GN	LC	LS	LG	LOC	OK	KU	PI	KA	CA	WA	CP	PP	PA
High Income Potential	5	3	5	3	5	5	3	5	5	2	2	0	0	3	0	3	2	2
Food Security Commodity	5	5	5	4	4	5	3	5	4	3	2	0	0	5	0	5	2	3
High Employment sub-sector	5	4	5	3	5	5	3	5	5	1	2	0	0	3	0	3	2	2
Short Maturing Cycle	5	3	5	4	5	2	2	2	2	5	5	0	0	1	3	5	5	4
Requires Limited Input Utilization	5	5	4	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5
Not Prone to Pest & Disease	4	4	3	4	4	4	4	4	4	4	4	5	4	5	4	4	4	4
Accepted by Local Communities	5	3	5	2	5	5	4	5	5	3	4	0	2	3	3	3	3	3
Total Score	34	27	32	25	33	29	23	31	30	23	21	10	7	25	15	29	23	23
Mean Score	4.9	3.9	4.6	3.6	4.7	4.1	3.2	4.4	4.2	3.3	3	1.4	1	3.6	2.1	4.1	3.3	3.3

Legend:

5: (exceeds selection benchmark); 4: (Excellent potential); 3: (Above average potential); 0 – 2(below average)

S: Sorghum; MI: Millet; MA: Maize; SE: Sesame; GN: Groundnut; LC: Local Cattle; LS: Local Sheep; LOC: Local Chicken; OK: Okra; KU: Kundra; PI: Pineapple; KA: Kales; CA: Cassava; WA: Watermelon; CP: Cow Peas; PP: Pigeon Peas; PA: Potato

3.2.5 Sorghum Value Chain Map for Cueibet, Jur River, Gogrial East, Twic Counties



A, B, C, D represent services offered by the artisanal millers based in the market centers. Prices of sorghum have increased forth fold when compared with the prices two years given the scarcity of the commodity experienced as a result of COVID-19 pandemic that has limited cross-border and cross-county movement of traders.

3.2.6 Qualitative Market Systems Analysis, Gogrial East County:

Roads to and from the Gogrial East market: The county consists of two main earth roads passing through the main market center. There is limited interaction and between the county market with other neighbouring geographical markets (Gogrial West, Twic and Tonj Counties). Gogrial East market is therefore not spatially integrated with other markets.

Market Infrastructure/ Facilities in Gogrial East County: The county lacks standard market infrastructure; there is lack of running water, lack of standard drainage canals, lack of standard marketing stalls and display table. The materials used for construction of the main markets are bamboo, iron sheets and in some cases timber. Whereas the main market is organised, the lack of basic market facilities impedes business development and growth.

Water and sanitary Condition: The main market lacks water and sanitation facilities which create health hazards as this creates breeding grounds for market pests and diseases that during rainy season worsen as a result of poor drainage system. Dirt and market waste dot the main market making the environment around the market centers unclean.

Traders Arrangement/ Locations: The trader arrangement in the market is well organized. But there is lack of standard units of commodity measurement in the market. “Malwa” cups, basins and bucket are used as unit of measurement in the main market.

Market Structure, Market Taxes and Market Fees: The market structure is fragmented with mainly retailers and smallholder farmers engaged in production and marketing agricultural produce. Traders pay a monthly market tax of SSP500 and daily market fees of SSP50.

Financial Service Providers: Informal financing mechanisms exists in the county where individual money lenders and emerging VSLAs play a role financing of smallholder farmers.

Rules and regulations exiting in the markets in the priority locations: The local Gogrial council enforce rules and regulations in the market.

S.W.O.T Analysis of the market:

Strength of the market system: The agro-ecological condition is suitable for the production of sorghum, maize and groundnut given the ample rain and rich fertile soils.

Weakness of the market system: The lack of high quality planting materials (certified seeds) results in low yield achieved every harvest season. This is in addition to the fact that agricultural producers lack appropriate skills and primary value addition systems.

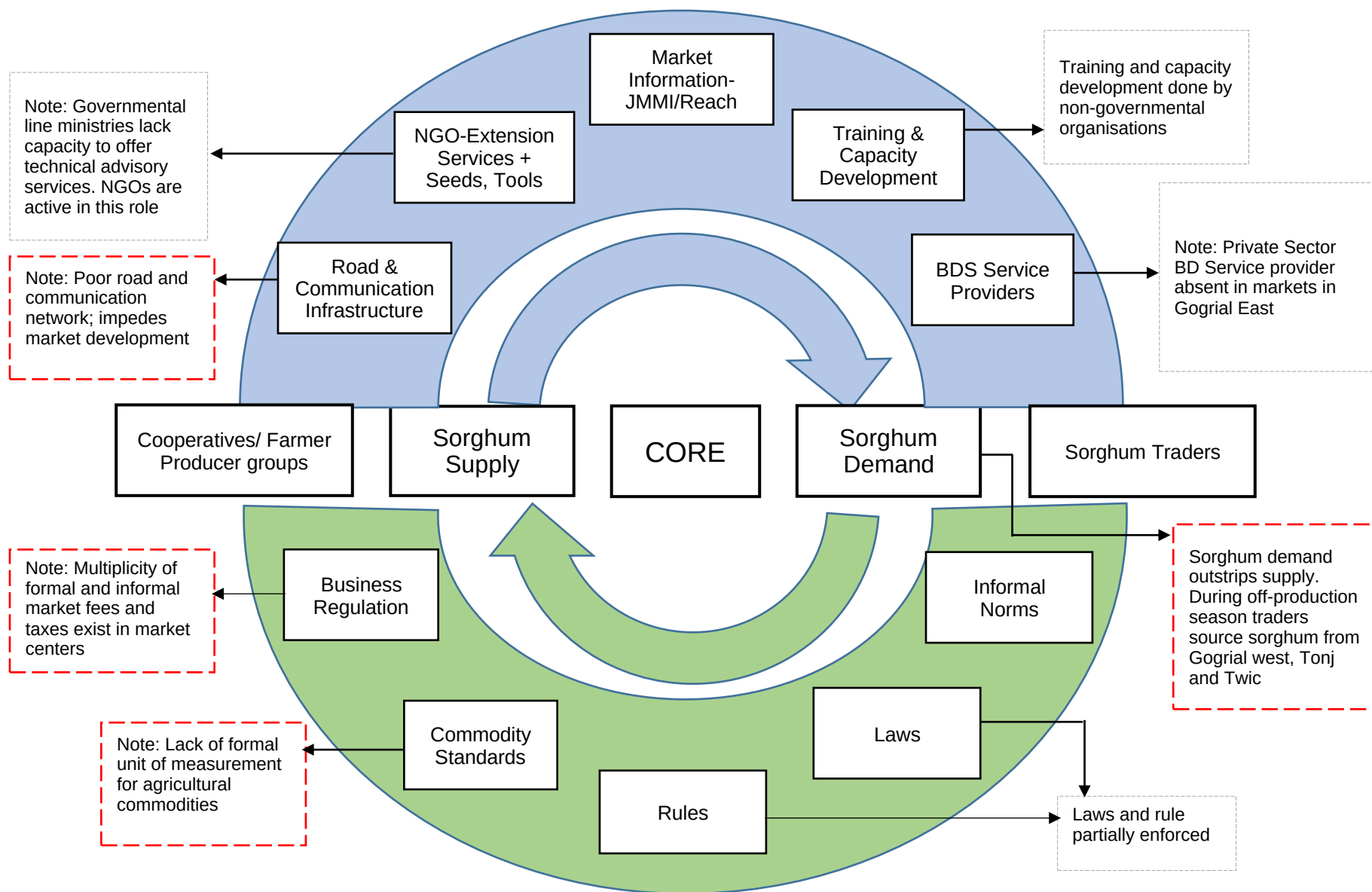
Opportunity in the market system: There is ready demand for agricultural commodity in the market.

Threat in the market system: Excessive rainfall causes flooding that occasionally destroys crops in the farms that result to loss in produce and income.

Causes of Market Failure: The lack of proper market infrastructure coupled with poor road prevents market development

Areas for MSME Entrepreneurial Development and Growth: Areas for growth are in introduction of high quality seeds, construction of standard storage units and supporting emerging MSME agri-processors by providing them with technical and business skills.

3.2.7 Market System Map for Sorghum in Gogrial East County



3.2.8 Qualitative Market Systems Analysis, Jur River County:

Roads to and from Jur River County market: The county border to Wau geographical market to the west and Warrap to the east. Whereas within town the road is partially tarmacked thus facilitating ease in moving agricultural commodities to and from the market, the payam level (Udici, Marial, Wan-bai, Rojrojdong and Kuajina) road are earth in nature; during rainy season they are rendered almost impassable.

Market Infrastructure/ Facilities in Jur River County: Like in Cueibet and Gogrial East Counties, the state of infrastructure in the market is wanting; the market stalls are poorly constructed with bamboo poles, iron sheets and timber.

Water and sanitary Condition: Water and sanitary conditions are poor rendering the market a potential breeding area for pests.

Traders Arrangement/ Locations: The traders are well arranged in the market although there is limited constellation of marketing channels in the county.

Market Structure, Market Taxes and Market Fees: The market structure is composed of wholesalers, retailers and petty traders. The number of retailers is more than the number so wholesalers in the market.

Financial Service Providers: Formal financing mechanism exist in the form of KCB, Dahabshil and Agricultural Finance of South Sudan (AFSS); however currently, AFSS does offer loans to farmers. The other formal banks existing in the do not offer loans to the smallholder farmers; they consider the smallholder farmers as high risk segment of the finance market.

Rules and regulations exiting in the markets in the priority locations: County councils oversees the affairs of the market; the council is tasked with collection of market fees and taxes.

S.W.O.T Analysis of the market system:

Strength of the market system: There is ready market for groundnut, sorghum and maize. Further the VSLAs are active in the county that ensures smallholder farmers access loans. In addition, the land is fertile, and this coupled with ample rainfall ensure the county produce crop for local consumption albeit on small-scale (not able to meet county consumption demand)

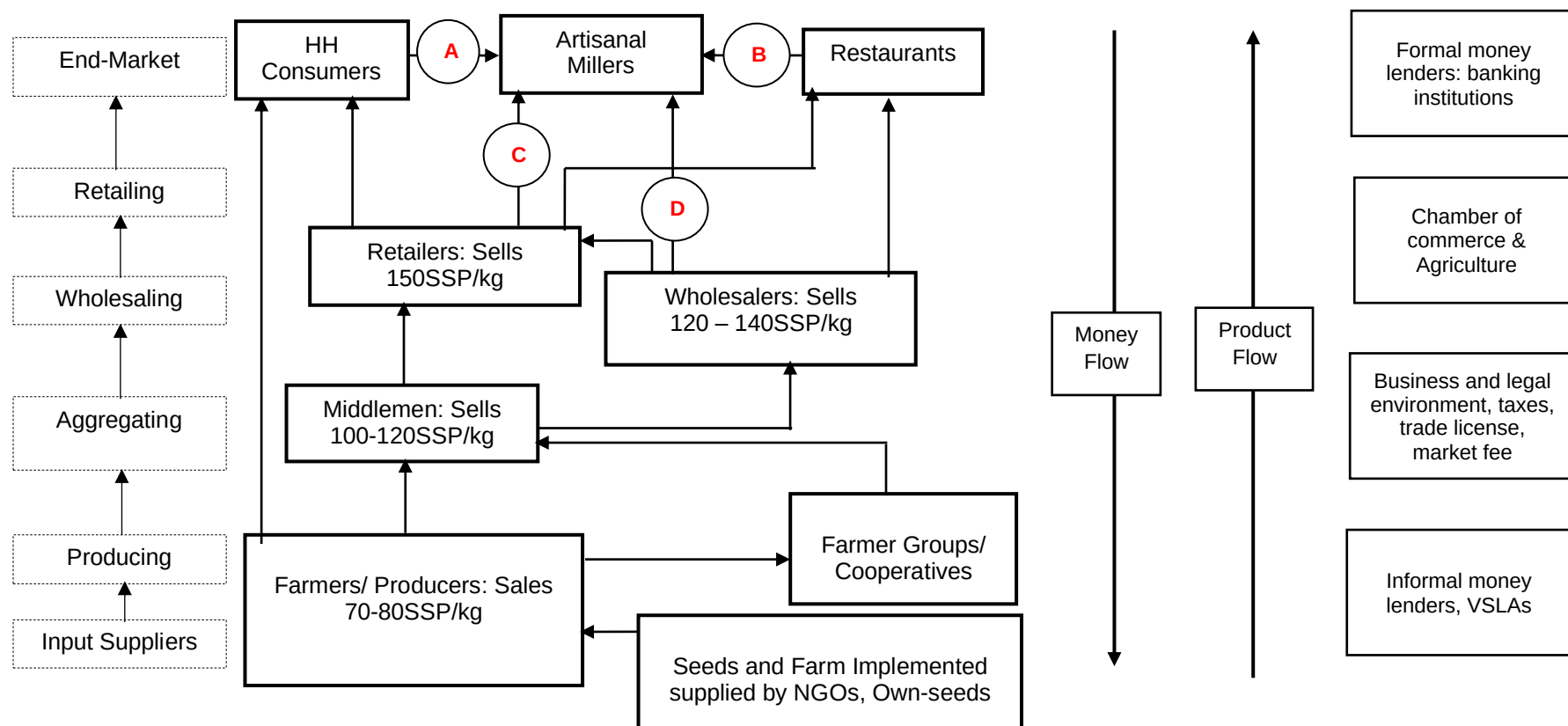
Weakness of the market system: There is lack of certified seed in the county. Most farmer use previous harvest grains as seed resulting to low crop productivity. Whereas limited number of farmers supported by non-governmental organisations receive seed; this negates agribusiness and market development; as would-be agri-input businesses are unable to be established.

Opportunity in the market system: Opportunity abound in the market; given its high population, there are opportunities to establish medium-scale processing units such for such commodities as maize and groundnut.

Causes of Market Failure: Inaccessibility to affordable credit lines by farmers, and poor road infrastructure especially at the payam levels result to failure in the development of a vibrant market in the county.

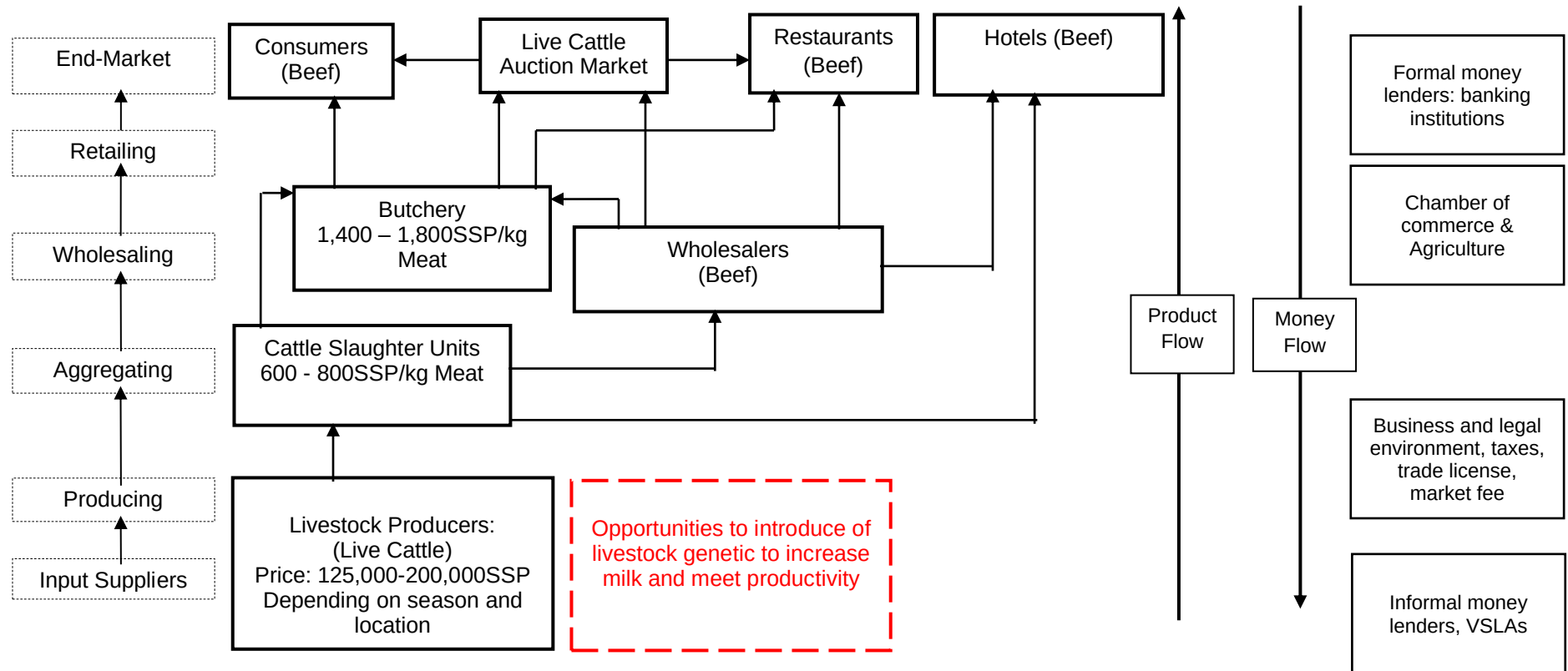
Areas for MSME Entrepreneurial Development and Growth: Areas for growth are in introduction of high quality seeds, construction of standard storage units and supporting emerging MSME agri-processors by providing them with technical and business skills.

3.2.9 Maize Value Chain Map for Cueibet, Gogrial East, Jur River And Twic Counties

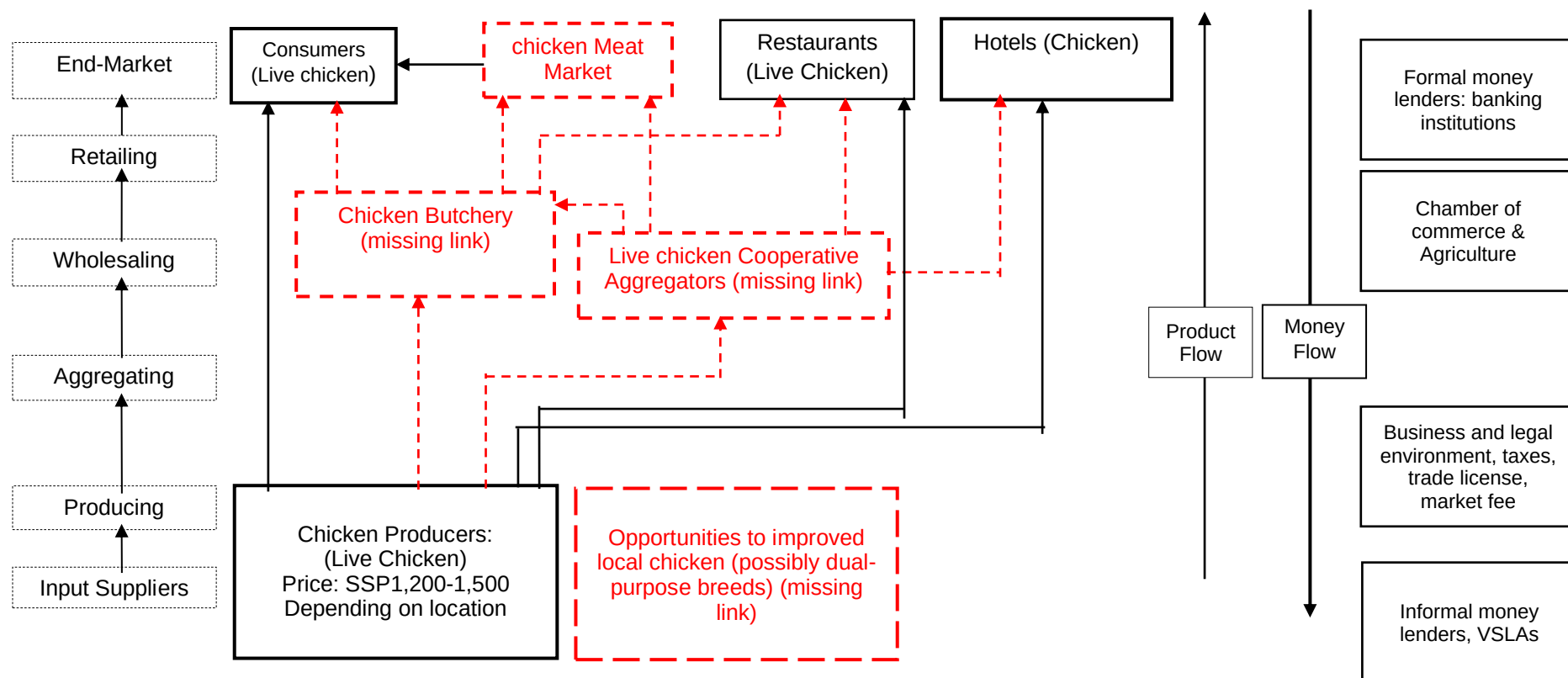


A, B, C, D represent services offered by the artisanal millers based in the market centers. Prices of sorghum have increased four fold when compared with the prices two years given the scarcity of the commodity experienced as a result of COVID-19 pandemic that has limited cross-border and cross-county movement of traders.

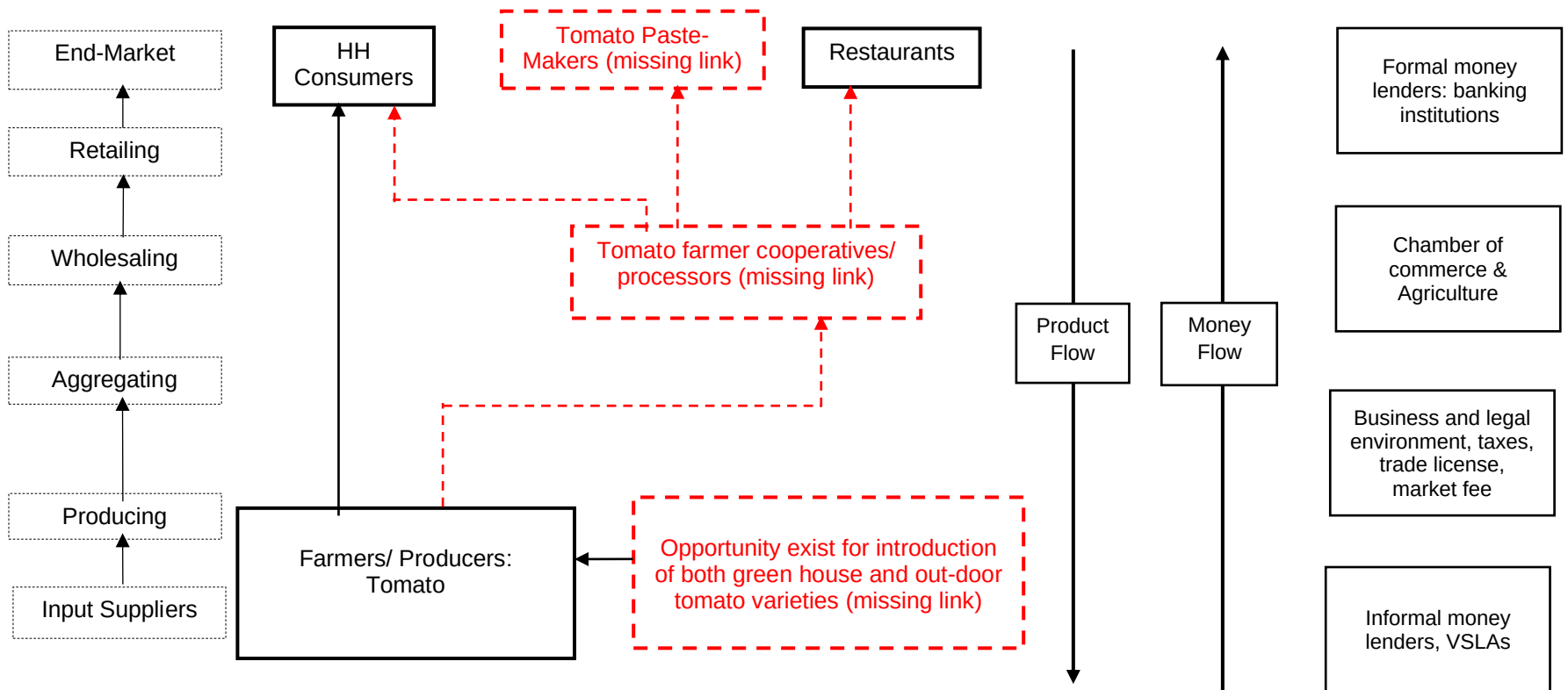
3.2.10 Value Chain Map for Cattle in Cueibet, Gogrial East Jur River And Twic Counties



3.2.11 Value Chain Map for Local Chicken In Cueibet, Gogrial East, Jur River And Twic Counties



3.2.12 Value Chain Map for Tomato In Cueibet, Gogrial East, Jur River and Twic Counties



3.2.13 Qualitative Market Systems Analysis, Twic County:

Roads to and from Twic County market: Twic County is located near Gogrial West County to the south-west and Gogrial East county to the south-east. The roads are tarmacked only in the town center but as one moves away from the town one finds earth roads. Communication network is unavailable in some locations of the county. The soils have high amount of clay rendering them almost impassable during rainy seasons.

Market Infrastructure/ Facilities in Twic County: The state of market infrastructure is better than that of Cueibet and Gogrial East Counties. Some market structures are constructed using standard construction materials (mortar and brick) while most are semi-permanent in nature. Major agricultural commodity wholesalers are noticeable in the market. Most of these wholesalers source their commodities from Khartoum via the “Amied” distribution point; they source agri-commodity from Amied given the fact that the local production is not able to satisfy the high demand existing in the county. The county is a net-grain importer.

Water and sanitary Condition: Water and sanitation condition is better than in Cueibet and Gogrial East County. The county market is partially clean; county council makes effort to ensure the market is clean most of the time.

Traders Arrangement/ Locations: The market is partially well-organised with traders of agricultural commodities and artisanal processes located on one side of the market

Market Structure, Market Taxes and Market Fees: The market has wholesalers and retailers. Similarly grain flour is popular commodity in the market sold by both wholesalers and retailers. Most of the flour finds way into the market from the Amied commodity market mid-way between Khartoum and Twic.

Financial Service Providers: Informal financing mechanisms exist in the form of VSLAs and private money-lenders.

Rules and regulations existing in the markets in the priority locations: Marketing rules and regulations are enforced by the county council.

S.W.O.T Analysis of the market system:

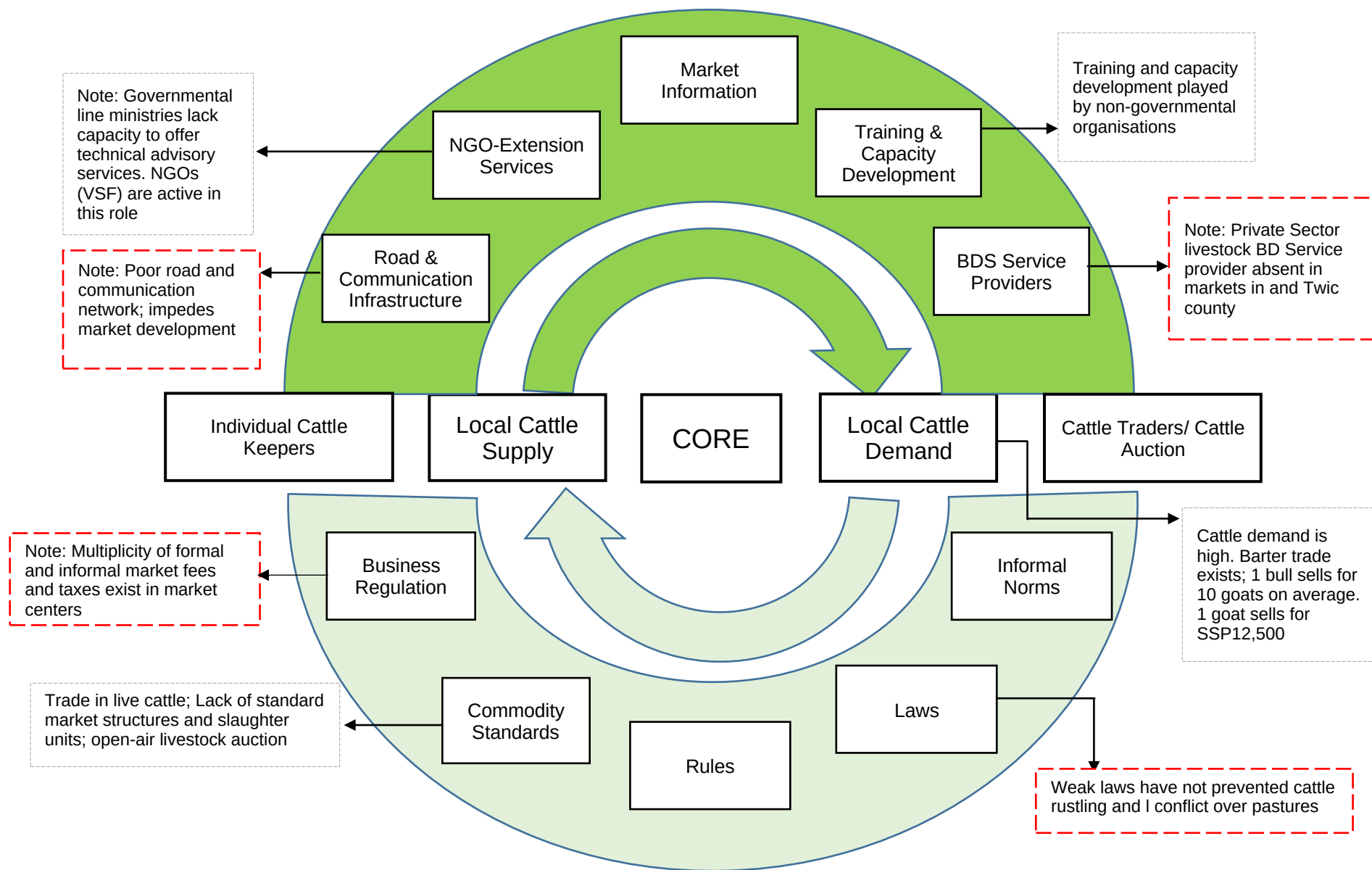
Strength of the market system: The ample rainfall is sufficient for the production of major agricultural commodities such as sorghum, maize and groundnut. The marketing environment is well organized with emerging MSME agri-processors.

Weakness of the market system: The lack of high quality seeds reduces crop productivity. Further the limited financing options prevent the development of vibrant agribusinesses.

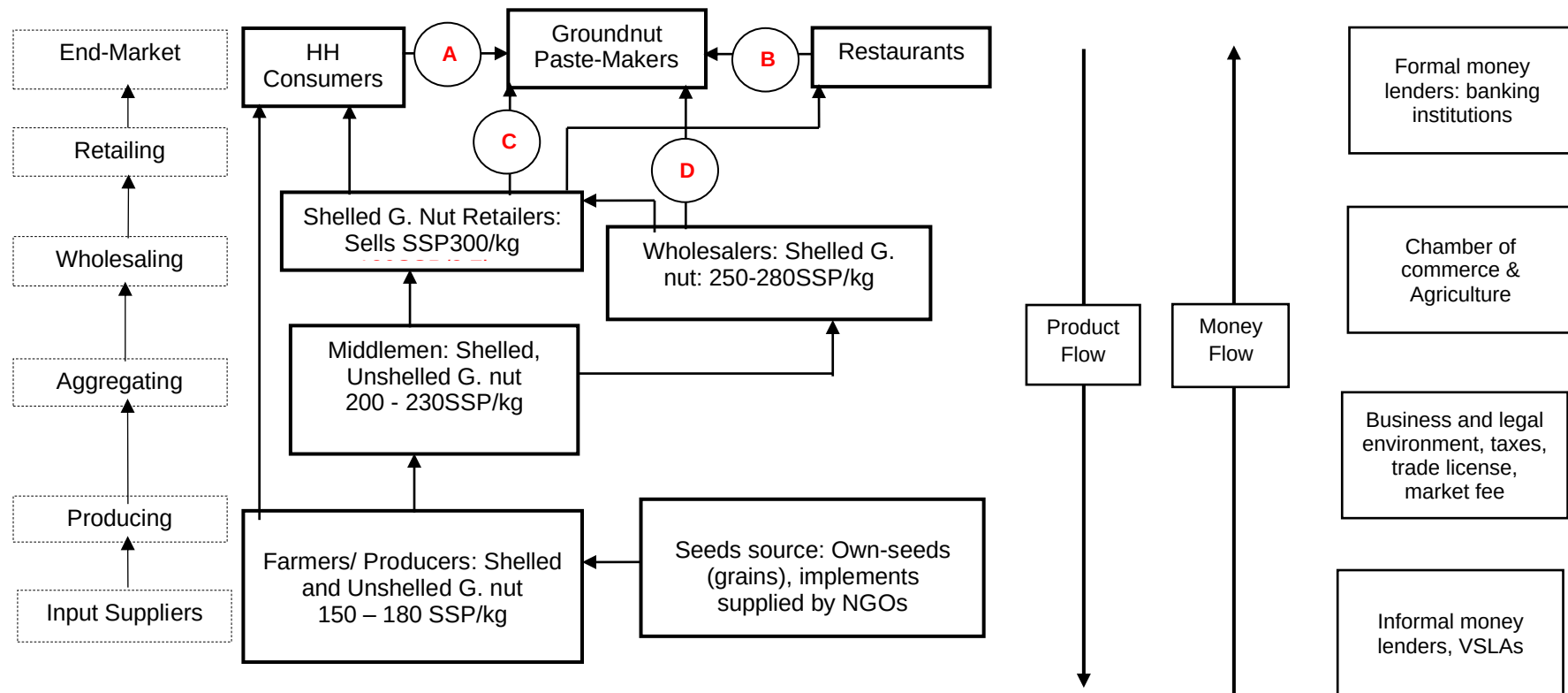
Opportunity in the market system: Opportunities exist in the form of enhanced crop productivity through usage of appropriate technologies such as certified seeds and reduction of post-harvest losses through usage of for example hermetic storage technology (HST) double/ triple layer storage bags to reduce post-harvest losses.

Areas for MSME Entrepreneurial Development and Growth: Areas for MSME Entrepreneurial Development and Growth: Areas for growth are in introduction of high quality seeds, construction of standard storage units and supporting emerging MSME agri-processors by providing them with technical and business skills.

3.2.14 Market System Map for Indigenous Cattle Twic County



3.2.15 Groundnut Value Chain Map for Cueibet, Gogrial East, Jur River and Twic Counties



A, B, C, D represent services offered by the artisanal millers based in the market centers. Prices of sorghum have increased four fold when compared with the prices two years given the scarcity of the commodity experienced as a result of COVID-19 pandemic that has limited cross-border and cross-county movement of traders.

CHAPTER FOUR: CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The FORESITE project has great potential to create significant positive impact to project beneficiaries in the priority locations. The main value chain identified with great income potential are sorghum, maize and groundnut. In terms of livestock the main value chains identified are indigenous cattle, indigenous goat and indigenous chicken.

Potential for cereal value chains (sorghum, maize and groundnut) are in the areas of supplying or encouraging production of high quality certified seeds, Avail appropriate production and value addition technologies to the farmers in the priority project locations. Assessment results shows that on the overall in Cueibet County 100% of farmers are engaged in sorghum production, 47% in maize production and 100% in groundnut production. In Gogrial East county 100% of farmers are engaged in sorghum production, 66% in maize production, 55% in millet production and 88% in groundnut production, In Jur River County 99% of farmers are engaged in sorghum production, 68% in maize production, 97% in cowpea production, 51% in bean production and 97% in groundnut production; and in Twic County 100% of farmers are engaged in sorghum production, 82% in maize production and 73% in groundnut production.

In term of livestock on the overall in Cueibet County 86% of farmers rear local cattle, 96% rear local goats and 78% rear local sheep and 79% rear local chicken. In Gogrial East, 61% of farmers rear local cattle, 75% rear local goats and 55% rear local sheep, 75% rear local chicken. In Jur River County, 40% of farmers rear local cattle, 82% rear local goats and 59% rear local sheep, 53% rear local chicken, and in Twic County 64% of farmers rear local cattle, 75% rear local goats, 41% rear local sheep and 43% rear local chicken.

More trainings on good agricultural practices (GAP) and farming as a business are advocated in order to turn around the farmers from semi-commercial to fully commercial producers. There is also a need to support farmer-based institution (cooperatives, farmer association and VSLAs) in terms of building their capacities on group dynamics, group governance and other management practices. Providing training and capacity building in these areas lead ensure significant positive results are achieved. On the livestock front, the identified value chains can only achieve significant impacts if suitable mechanisms for access livestock health products is developed. Equally important will be the need to training community animal health workers (CAHW) in the respective project location; these would be deployed to support the priority livestock in terms of providing animal health technical support.

Importantly, given the production and value addition challenges identified, there is a need to establish centers of agricultural technology and commercialization (CATC) in the respective counties. These should act centers where appropriate technologies are experimented, where local implements are fabricated and where training and capacity development of farmers takes place in the field of MSME business development and management.

4.2 Recommendations

VALUE CHAIN ANALYSIS SUMMARIES AND RECOMMENDED ACTION PLAN

VALUE CHAIN	VALUE CHAIN ANALYSIS	VALUE CHAIN POTENTIAL	EMPLOYMENT POTENTIAL	INTERVENTION PATHWAY	LIMITATION	RECOMMENDATIONS
Sorghum	Many “land races” with varying genetic potential; yield could be enhanced through cross-breeding local landraces with high-yielding exotic varieties	Available sorghum landraces in the country are drought tolerant while others are waterlogging tolerant; opportunities lie in flour blending & fortification to improve nutritional status of women and children, and simple local chicken feed formulation (to improve marketable weight of local chicken)	Strong self-employment sub-sector at the farmer level as well as at the value addition level. Sorghum is also a food security crop	At farmer-level: build capacities of farmers on agronomy, provide training and capacity development in agronomy, post-harvest operation and value addition At farmer cooperative level: Support in building the capacities on proper storage, and pest and disease management and basic value addition At MSME level: Upgrade milling Units in market centers, support emerging micro-millers, construct proper milling housing units, provide	Low productivity due to use of inferior planting materials High cost of operating the existing milling unit/ energy inefficient	Enhanced training of farmers on sorghum agronomy, post-harvest operation and value-addition

				support on inventory management		
Maize	Use of grain as seeds reduce productivity; High quality seed maize suitable for the project location not available	There is great potential in the emerging milling industry including flour blending of maize flour with other grain flour and fortification to improve nutrition status of women and children; By-products could be used to formulate indigenous chicken feed that could shorten the period chicken reach marketable weight	Strong employment sector at farmer level as well as at the value addition level	At farmer-level: build capacities of farmers on agronomy; provide training and capacity development and processing At farmer cooperative level: Support in capacity building and training on maize production, post-harvest management and value addition At milling level: Up-grade milling facilities, construct proper milling housing units, provide support on inventory management	Currently, the country does not have seeds bred for the project location; Lack of fund to breed high yielding seed maize varieties High operation costs (fuel) for milling units and distance to access spare parts	Capacity building and training on production and value addition; Further experiment need to be conducted on the suitability of PALOTAKA, NIITA and PITIA seed maize varieties in the form of “Adaptive trials” Financial support to emerging millers to procure of up-grading existing milling units Training of MSMEs business on value addition
Groundnut	Local varieties (red beauty and white type very popular in the four counties	Opportunities lie in groundnut paste production	In production at farm level. In local cottage industry/ artisanal millers in paste production	At farmer-level: build capacities of farmers on agronomy (provide training and capacity	High operation costs (fuel) for milling units and distance to access spare parts.	More capacity development is required on production and value addition

				development and processing. At farmer cooperative level: Support in procurement of milling unit + spare parts + training unit operators At milling level: Up-grade milling facilities at MSME level, provide support on inventory management	Challenge in accessing package materials for groundnut paste	
Local Chicken	A neglected sub-sector by both at the farmers and the NGO level	Opportunities exists given the fact that the birds can scavenge as well as obtain feed supplementation from sorghum and maize grains	Strong employment sector at farmer level and marketing level	Training and capacity development on production of chicken, and local feed formulation to improve marketable weight and shorten time to market	Preponderance of chicken diseases (fowl typhoid, new castle, etc)	More capacity development is needed production and marketing, future project should also be strong on disease prevention and control

Note: Training activities should be preceded by development of “standard training manuals” on agronomy, livestock management and agribusiness management. The training manual should be simplified so that they are understood by FORESITE beneficiaries. There are a lot of important information on “[SORUDEV Cereal Crop Production Training Manual](#)” that can be adopted and contextualized.

PROPOSED “FORESITE” ACTIVITIES IN CUEIBET, GOGRIAL EAST, JUR RIVER AND TWIC COUNTIES

	VALUE CHAINS	CHALLENGES	PROPOSED PROJECT ACTIVITIES
1	Maize, Sorghum and Groundnut	• Inaccessibility of high quality and affordable seeds • Low agricultural productivity • Lack of skills on good crop husbandry practices • Preponderance of pests and diseases • Lack of appropriate value addition technology • Lack of affordable credit lines • Lack of standard storage technologies • Lack of skills on “Farming as a Business” (FAAB)	• Community-based seed production • Engage local emerging seed companies in seed production • Piloting of seeds produced elsewhere under local conditions • Training on good agricultural practices (GAP) and follow-up refresher trainings; training to be practical in approach; promote introduction standard hoes for farming purposes, build technical skills of farmers on crop husbandry • Training on cultural practices in pest and diseases control including proper farm hygiene, weed management, importance of maintaining crop spacing, etc • Pilot introduction of mobile threshers, winnowers, manual maize shellers, manual milling units, groundnut paste-makers • Support establishment of village loans and saving association (VSLA); where they exist, more trainings to be given and where possible support them with seed capital on a case-by-case basis • Explore opportunities to network with East African Grain Council (EAGC) with an aim of accessing standard and certification with respect to construction of agricultural commodity warehouses for cooperatives • Provide financial support in the construction of warehouses in selected farmers cooperatives; rehabilitate worn out warehouses • Provide support in business planning and business plan development

	VALUE CHAINS	CHALLENGES	PROPOSED PROJECT ACTIVITIES
			• Conduct trials to determine the efficacy of biological pest control such as the “neem” tree extracts; the results if positive to be documented and adopted; • Promote introduction of hermetic storage technology (HST) bags • More training on farm business management, financial management, record keeping, stores management, marketing and selling
2	Tomato	• Inaccessibility of high quality and high yielding tomato seeds • Lack of skills on tomato production • Preponderance of pests and diseases • Lack of affordable credit lines to procure hybrid tomato seeds • Lack of skills on “Farming as a Business” (FAAB)	• Promote hybrid tomato varieties such as Cal-J, Rio-Grande, Assila-F1, Eden F-1, etc which yield approximately 15,000 – 23,000kg/ acre • Provide training on tomato production • Provide capacity building and training on pests and disease management especially verticillium and fusarium wilt diseases • Support establishment of VSLA groups where non exist. In locations where VSLA groups exist, they should be provided with more training on business management and value addition; the VSLA should also be used as training forum • Provide training on value addition and marketing

	VALUE CHAINS	CHALLENGES	PROPOSED PROJECT ACTIVITIES
3	Livestock: (Local Cattle, Local Goat and Local Sheep)	• High incidences of livestock pests and diseases • Lack of skills on livestock husbandry practices • Lack of standard market infrastructure for livestock and livestock product marketing • Lack of affordable credit lines for livestock farmers • Lack of skills on livestock business management	• Provide training on routine livestock husbandry practices including control of ectoparasites and endo-parasites; for a livestock enterprise training of community livestock health workers (CLHW) on de-worming procedures • Avail recommended livestock health products such as broad-spectrum de-wormers such as levamisole oxyclozanide, albendazoles, and ecto-parasiticides such as Armitraz (12.5% w/v) for control of ticks and buparvaquone for treatment of tick-borne related ailments such as ECF, Theileriosis and Anaplasmosis, etc) • Support formation of VSLA where non exist • Training on livestock business management
4	Livestock (Local Chicken)	• High incidences of poultry pests and diseases • Lack of standard market infrastructure for poultry and poultry product marketing • Lack of skills on livestock business management	• Training on poultry diseases and control • Provide support (where possible) in construction of poultry housing and market infrastructure • Training on poultry business management

PROPOSED “FORESITE” ACTIVITIES IN CUEIBET, GOGRIAL EAST, JUR RIVER AND TWIC COUNTIES

	VALUE CHAINS	CHALLENGES	PROPOSED PROJECT ACTIVITIES
1	Maize, Sorghum and Groundnut	• Inaccessibility of high quality and affordable seeds • Low agricultural productivity • Lack of skills on good crop husbandry practices • Preponderance of pests and diseases • Lack of appropriate value addition technology • Lack of affordable credit lines • Lack of standard storage technologies • Lack of skills on “Farming as a Business” (FAAB)	• Community-based seed production • Engage local emerging seed companies in seed production • Piloting of seeds produced elsewhere under local conditions • Training on good agricultural practices (GAP) and follow-up refresher trainings; training to be practical in approach; promote introduction standard hoes for farming purposes, build technical skills of farmers on crop husbandry • Training on cultural practices in pest and diseases control including proper farm hygiene, weed management, importance of maintaining crop spacing, etc • Pilot introduction of mobile threshers, winnowers, manual maize shellers, manual milling units, groundnut paste-makers • Support establishment of village loans and saving association (VSLA); where they exist, more trainings to be given and where possible support them with seed capital on a case by case basis • Explore opportunities to network with East African Grain Council (EAGC) with an aim of accessing standard and certification with respect to construction of agricultural commodity warehouses for cooperatives • Provide financial support in the construction of warehouses in selected farmers cooperatives; rehabilitate worn out warehouses • Provide support in business planning and business plan development

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	VALUE CHAINS	CHALLENGES	PROPOSED PROJECT ACTIVITIES
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4	Livestock (Local Chicken)	• High incidences of poultry pests and diseases • Lack of standard market infrastructure for poultry and poultry product marketing • Lack of skills on livestock business management	• Training on poultry diseases and control • Provide support (where possible) in construction of poultry housing and market infrastructure • Training on poultry business management

4.3 Recommendations for Value Chains Up-Grading Strategies

In order to formalize the selected value chains and turn them in profitable ventures for all value chain players, the following value chain up-grading strategies is recommended in the FORESITE project counties of Cueibet, Gogrial East, Jur River and Twic.

1) Agricultural and Livestock Product Up-grading:

It is recommended that the FORESITE project introduce, initially on experimental basis and later on full-scale operation, better crop and livestock production technologies to increase agricultural and livestock productivity. The following technologies are proposed:

- For the maize, sorghum and groundnut value chains: the project should pilot new seed varieties that have been bred locally and outside the country to determine their efficacy and productivity before adoption. Such seed varieties include Longe-4, Longe-5, Longe-10, PALOTAKA, NIITA, Seso-III, Serena, Seredo, among others. The use of demonstration plots as “centers-of-excellence” to conduct these experiments is recommended. The project should also reach out to regional seed companies such as Pioneer, Syngenta, Pannar for purposes of cross-learning and also explore possibilities of partnership engagement;
- Alternatively, the project should introduce community-based seed production in selected farmer groups/ cooperatives societies. This will require importation of “foundation seeds” from the region. Before importing, the project will have to comply with all the local requirements needed for importation of foundation seeds. Or contract local seed companies to produce seeds behalf of project beneficiaries. Emerging local seed companies in the country include: Seed Grow Limited, Pro-Seeds Limited and Gumbo-Glow Seeds Limited;
- For the cattle and goat value chains: crossing of the local cattle breed with exotic genetics is recommended. Initially, on experimental basis, the project to should explore how it could engage with producers of livestock genetics such as American Breeder Services (ABS)-Kenya, Central Artificial Insemination Services (CAIS)/ animal genetic resource center to supply genetic products to cross the local breeds and hence increase productivity of milk and meat. Cross-learning with be required with countries that have been on the forefront of cross-breeding (Uganda and Kenya). The overarching objective being to diversify income base among the farmers and agro-pastoralist as well as increase nutritional status of women and children. Dairy production is unexploited segment of the livestock value chain not only in the project locations but also in the entire country.

2) Functional Up-grading:

- The project should support beneficiaries establish commodity aggregation (warehouses) centers either at group or cooperative levels. Where these infrastructures exist, then they should be up-graded through repair of leaking roofs or dilapidated walls. This will reduce post-harvest losses. Another important functional up-grade is the use of hermetic storage

technology (HST) bags that can be introduced to reduce post-harvest losses that is high due to poor storage methods done by the project beneficiaries;

- Introduce on-farm value addition technologies to increase the quality of produce reaching the market. Such technologies include use of manually-operated threshers and winnowers, manual maize shellers, manually-operated grain millers and paste-makers. More studies to be done to understand the cost outlay, availability of spare parts, and possibility of training selected youths via TVET within the project locations on fabrication technologies of selected local value addition units;
- Farmer cooperatives/ groups should be encouraged to carry out processing of agricultural produce; this will earn income for the cooperative. Where artisanal processors exist at the farmer cooperative level, then they should be provided wherever possible with seed capital to up-scale their processing businesses, in addition to training on quality assurance, business management and storage management.

3) Facilitate Coordination and Market Access:

- The project should help enhance access to vital market information via radio programs that are relatively inexpensive. UNMISS radio offer free services as long as the theme of the programme is on agriculture. Additionally, the project should continue to proactively participate in the JMMI/ REACH commodity market price collection initiative. Establishment an M.I.S platform for market price information gathering and analysis is of paramount importance.

4.4 Viable Agri-Business Model Canvas

PROPOSED BUSINESS CANVAS FOR FARMERS' COOPERATIVE/ GROUPS IN THE FORESITE PROJECT LOCATIONS				
PROPOSED PARTNERS - World Vision South Sudan - NRC - AVSI - Farmer Cooperatives/ Groups	PROPOSED CORE ACTIVITIES - Procurement of grains - Sales and Marketing - Extension service - Farmer input supply	VALUE PROPOSITION (TO Farmers) - Affordable Lines of Credit “Market-oriented” extension services - Technical and Business Support - Quality & value-added products	CUSTOMER RELATIONSHIP Customer service	CUSTOMER SEGMENTS - County Market - Cross-county Market - National market
	KEY RESOURCES - Warehouse/ Grain Aggregator - Manpower - Network of market opportunities		MARKET CHANNEL - Wholesalers markets - Retail markets - Institutional Customers	GROUP/ COOP BUSINESS PLAN TEMPLATE:  Farmer Coop Business Plan Templ
PROJECTED COST STRUCTURE Transport Cost; Salary & Wages, Energy Cost; Packaging cost; Tax			REVENUE STREAMS TO THE COOPERATIVE Sales of agricultural commodities, Input Sales	

4.5 Indicative Capacity Building Plan for Farmers Cooperatives/ Groups In The FORESITE Project Sites

	1	2	2021				2022				2023			
	PROPOSED BUSINESS INPUTS	PROPOSED OUTCOMES	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Support farmers mobilization	farmers mobilized in FORESITE locations												
2	Build capacities of farmer groups on GAP, governance, group dynamics, etc	Capacity of farmer groups built on GAP, governance, group dynamics												
3	Build capacity of farmer groups on farming as business (FAAB), Book-keeping, VSLA	Capacity of farmers built on FAAB, book-keeping, VSLA												
4	Assess feasibility of grain storage facilities in selected groups/ coop.	Feasibility report to inform storage facilities establishment in selected groups												
5	Set up grain storage facilities (aggregators) in selected locations within FORESITE project sites	Grain storage facilities (aggregators) established in selected locations within FORESITE project sites												
6	Regular monitoring and evaluation to assess project impact	On-going regular monitoring and evaluation												

APPENDICES

Appendix 1: Data Collection Tools

Spreadsheet Analysis - Farmers	 Spreadsheet Analysis - Farmers.xl
Data Collection Tools	 Spreadsheet Analysis - Traders.xls
Raw Data Set	
Data Collection Tools	 Questionnaires.zip

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