



Ministry of Agriculture and Livestock



ASDSP II SUCCESS STORIES

NEWSLETTER

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Highlights

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EMBASSY OF SWEDEN

KENYA



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ABOUT ASDSP II

The Agricultural Sector Development Support Programme phase II (ASDSP II) was formulated in 2016 to consolidate the gains made in ASDSP I (2012-2016) and contribute to the realization of the ideals of the Agricultural Policy. In addition to this, the Programme supports the new Swedish Cooperation Strategy for development cooperation as it responds to Area 3 “Better opportunities and tools to enable poor people to improve their living conditions” The programme aims at transforming crop, livestock and fishery production into commercially oriented enterprises that ensure sustainable food and nutrition security by developing value chains that are environmentally resilient and socially inclusive.

Pursuant to this objective, the programme addresses agricultural sector transformation through consultation, collaboration and coordination at the national, intergovernmental and county levels. The programme which is implemented by both the county and national governments is financed by the Government of Kenya (National and County), Government of Sweden and the European Union at a cost of KES 5.692 billion for a period of 5 years (December 2017 to June 2022)

ASDSP II operates through collaborations and partnerships and targets 700,000 value chain actors in order to achieve 4 key outcome areas:

Outcome 1: Productivity of priority value chains increased

Outcome 2: Entrepreneurial skills of priority value chain actors strengthened

Outcome 3: Access to markets by priority value chain actors improved

Outcome 4: Structures and capacities for consultation, collaboration, cooperation and coordination in the sector strengthened

The prioritized value chains are shown in the table below.

Implementation of the programme is operationalized through a 3-tier approach encompassing national, intergovernmental and county levels. The national comprises the Joint Agricultural Sector Steering Coordinating Committee (JASSCOM) and the National Programme Secretariat (NPS) whereby, JASSCOM is the steering committee for the programme whilst the NPS provides technical and strategic capacity support to the Counties with regard to programme implementation as well as supporting specific value chain development activities at the national level.

At the inter-governmental level, the JAS-IGS (Joint agricultural sector intergovernmental secretariat provides secretariat functions to JASSCOM such as organizing for JASSCOM meetings, following up on JASSCOM resolutions; organizing, formulating and circulating sector reports among others.

At the County level, the County Agricultural Sector Steering Committee (CASSCOM) provides an oversight role to the programme while the County Programme Secretariat (CPS) coordinates programme implementation at the County level.

The programme has made significance achievements in the outcome areas, in the past 5 years:

- A total of KES of KES 1.5B issued to 47 counties for support of Innovation and technologies promotion.
- Average % change in gross margins (GMs) increased from 36.6 to 48.4 in 2019 and 2022.
- **2170** Service providers trained, **571,974** VCAs capacity build on different aspects of Entrepreneurial knowledge and skills.

- **219,414** Business Plans developed and **150,929** Business Plans Implemented.
- VCAs aggregated into 10,250 VCOs to improve market linkages and access.
- Development of digital marketing platform (E-Commerce Platform).
- 337,486 VCAs (93%) have access to market information. Market access improved from 370,000 VCAs (74%) in 2019 to 455,000 VCAs (91%) in 2022.
- 287,000 VCAs linked and accessing financial services.
- Joint Agricultural Sector Steering Committee (JASSCOM) and 47 County Agricultural CASSCOMs established & in operation and trained.
- JASSCOM operations and SWAGs activities supported through JAS/IGS.
- Development of TIMPs portal <https://asdspkm.kilimo.go.ke/>

These short stories illustrate that with proper planning, formalization of value chain actors, effective linkages to service providers, financiers, insurers and markets it is possible to integrate small holder producers into modern VCs that provide better prices, and in the process facilitate their transformation from largely subsistence to commercial agricultural enterprises. The stories briefly describe the groups and in some cases the individuals, the challenges they faced, the key programme interventions and the resulting changes that the beneficiaries groups experienced that improved their livelihoods.

Priority Value Chains in each County

County	Priority Value Chains			County	Priority Value Chains		
Baringo	Goat Meat	Dairy	Honey	Mandera	Camel milk	Meat goat	
Bomet	Dairy	Potatoes Maize	Ind. Chicken	Marsabit	Meat Goats	Camel Milk	Kales
Bungoma	Dairy	Ind. Chicken	Tomatoes	Meru	Dairy	Bananas	Ind. Chicken
Busia	Ind. Chicken	Groundnuts	Fish	Migori	I/ Chicken	Dairy	S/ potatoes
E/Marakwet	Dairy	Ind. Chicken	I/Potato	Mombasa	Ind.chicken	L.Vegetables	Fish
Embu	Dairy	Bananas	Ind. Chicken	Muranga	Dairy	Bananas	French Beans
Garissa	Camel milk	Beef	Tomatoes	Nairobi	Dairy	Kales	Broilers
Homa Bay	Watermelon	Fish	Sorghum	Nakuru	Dairy	Pyrethrum	Fish
Isiolo	Beef	Camel milk	Tomatoes	Nandi	Dairy	Maize	Ind. Chicken Fish
Kajiado	Cow milk	Tomatoes	Beef	Narok	Dairy	Beef	Maize
Kakamega	Dairy	Maize	Ind. chicken	Nyamira	Dairy	Banana	L. Vegetables
Kericho	Ind. Chicken	Dairy	Tomatoes	Nyandarua	Dairy	Irish Potato	Fish
Kiambu	Dairy	Ind. Chicken	Bananas	Nyeri	Dairy	Beef	Irish Potatoes
Kilifi	Cassava	African Bird Eye Chili	Ind. Chicken	Samburu	Beef	Honey	Maize
Kirinyaga	Dairy	Bananas	Rice	Siaya	Mangoes	Fish	Ind. Chicken
Kisii	Dairy	Bananas	Ind. Chicken	T/Taveta	Dairy	Bananas	Ind. Chicken
Kisumu	Ind. Chicken	Fish	Cotton	T/River	Mangoes	Beef	Fish
Kitui	Ind. Chicken	Green grams	Sorghum	T/Nithi	Dairy	Bananas	Ind. Chicken
Kwale	Chillies	Ind.Chicken	Passion Fruit	T/Nzoia	Dairy	Maize	Ind. Chicken
Laikipia	Maize	Dairy	Meat goat	Turkana	Fish	Sorghum	Meat Goats
Lamu	Fish	Ind. Chicken	Cashewnuts	U/Gishu	Cow milk	Passion	Poultry
Machakos	Dairy	Ind. Chicken	Mango	Vihiga	Dairy	Bananas	Ind. Chicken
Makueni	Green grams	Ind. Chicken	Mangoes	Wajir	Camel milk	W/ melon	Ind. Chicken
				West Pokot	Meat goat	Honey	Ind. Chicken

Message from the National Programme Coordinator



The Agricultural Sector Development Support Programme II (ASDSP II) 2017-2022 is a sector wide programme that builds upon the gains made in ASDSP I, 2012 to 2016. It is financed by the Government of Kenya (National & County Governments), Government of Sweden and the European Union to support the transformation of the country's agricultural sector. It is implemented by all the 47 Counties through a value chain development approach. The overall goal of ASDSP II is to contribute to the transformation of crop, livestock and fisheries production into commercially oriented enterprises that ensure sustainable food and nutrition security while the purpose is to develop sustainable priority value chains for improved income, food and nutrition security.

ASDP II addresses the key problem areas that hinder commercialization of agriculture, that is, low productivity along the value chains, inadequate entrepreneurial skills among Value Chain Actors, low access to markets and weak and inadequate structures and capacities for consultation and coordination within the Sector. To achieve this, the programme enables stakeholders at the counties to objectively analyze their value chains and to prioritize actions for implementation that will lead to food security, income generation and promote gender equity.

In the past 5 years, ASDSP II has achieved a number of milestones that have positively impacted the lives of small holder beneficiary communities. The programme direct beneficiaries are 500,000 value chain actors distributed in the 29 value chains. On productivity, the programme has enhanced the capacities of 2041 service providers (public and private) on various technologies, innovations and management practices (TIMPs) and, has disbursed Ksh.1.15 billion to the 47 Counties to support the VCOs with implementation of prioritized TIMPs. The funds are expected to especially catalyse women and youth participation in the value chains, for their economic empowerment. Under the entrepreneurship and markets access areas, the programme has facilitated training of 2170 service providers on business development skills, entrepreneurship and market access. On sector coordination, the programme has supported the establishment of County Agriculture Sector Steering Committees (CASSCOMs) in the 47 counties and majority are in the process of institutionalizing them through legislative processes at the County Assembly.

I am therefore pleased to present these short impact stories that demonstrate how the programme has improved the incomes and livelihoods of the beneficiary communities. The stories briefly describe beneficiary group's activities, challenges faced, key programme interventions and resulting changes experienced by the beneficiaries.

I also take this opportunity to thank the Honorable Mithika Linturi, Cabinet Secretary, Ministry of Agriculture and Livestock Development, Kello Harsama, Principal Secretary, State Department for Crop Development, Jonathan Mueke, Principal Secretary, State Department for Livestock Development and leadership of all the 47 County Governments led by their respective Governors, for their leadership, guidance and support with required resources, the ASDSP staff, partners, stakeholders, and value chain actors for their immense contributions to the ASDSP II programme.

Jane Ndungu (Mrs.)

National Programme Coordinator

AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME II

PREAMBLE

Brief on National Agriculture and Livestock Extension Programme (NALEP)

National Agriculture and Livestock Extension Programme was developed in 2000 as an instrument to contribute to the implementation of National Agriculture and Livestock Extension policy.

The project was financed by the Government of Sweden in two phases, Phase one covered the period 2000-2007 and phase two from 2007-2012.

NALEP, was a nationwide programme implemented jointly by the Ministry of Agriculture (MoA) and the Ministry of Livestock Development (MoLD).

Its main aim was to reform agricultural extension services through decentralization as well as providing incentives for private sector to provide extension. In addition, the project introduced the institutionalization of business development in the agriculture extension while ensuring environmental conservation.

The programme integrated human rights approach by mainstreaming gender in all its activities and providing entry points for inclusion of vulnerable groups into the programme.

The key strategies of the programme to reform extension services focused on the following:

- a. Planning modalities and access to extension facilitating factors.
- b. Clientele empowerment/local institution building including stakeholder forums (SHF) Focal Area Development Committees (FADC) and clientele groups
- c. Stakeholder collaboration and networking
- d. Capacity building of extension service providers
- e. Contents and choice of extension messages
- f. Mainstreaming cross-cutting issues including researching on vulnerable groups
- g. Commercializing and privatizing extension service

By end of 2011, the project had the following achievements:

- i. Reached and trained 4.6 million small holder farmers
- ii. Formed 2279 Focal Area Development Committees
- iii. Developed 2279 Community Action Plans (CAPs)
- iv. Formed 34,125 Common Interest Groups (CIGs)
- v. Formed 2531 stakeholder forums
- vi. Fifty percent (50%) of farmers trained by NALEP reported increased productivity.
- vii. Most farmers (80%) expressed high satisfaction with the extension approach and that they were more involved in group activities than before
- viii. 47% of farmers had increased their marketed surplus production,

- ix. 30% of farmers had formal market arrangements,
- x. 9.3% of farmers were accessing credit from formal credit institutions, and
- xi. 39% of farmers had formal agreements with stakeholders,
- xii. Group approach enhanced leadership, life skills and social confidence among target communities.
- xiii. Most extension staff (69%) had been facilitated by NALEP to attend training (on average covering 5 different topical areas), which had enhanced their capability to disseminate skills and knowledge to farmers. Topics perceived to bring considerable impact entailed technologies that would enhance farmer ability to diversify farm enterprises.

Lessons learnt from implementing NALEP was the springboard for the Agriculture Sector Development Support Programme (ASDSP), whose objective is to commercialize agriculture through priority value chains. Focusing more on how the smallholder farmers link with other actor within the same value chain for mutual benefits.

Agricultural Sector Development Support Programme (ASDSP I)

Agriculture Sector Support Programme (ASDSP) was a sector wide programme with main objective of promoting development of environmentally – resilient value chains. It was supported by the Government of Kenya (MOALF), Sweden and other partners to support the transformation of Kenya's Agricultural sector into an innovative, commercial oriented industry. The main focus of ASDSP was commercialization of Agriculture. It was implemented from 2013 – 2018 in all the 47 counties.

To achieve this, the programme played a major role in enabling stakeholders at the Counties to objectively analyze their value chains and give priority for development those that promote food security, have the potential to involve the poor and promote gender equity. Other aspects considered include high market demand, potential for value addition and environmental sustainability. The primary instruments that bring stakeholders together for this purpose were the outcome of the initial activities of the programme in mobilizing stakeholders in the sector. They were the County Value Chain Forum which consisted of a wide spectrum of stakeholders in the agricultural sector. Their main role was decision making on issues that affected the sector and prioritizing value chains for development. The second was the Value Chain Platform which was made up of stakeholders engaged in a single value chain. They were the agents of change.

They focused on specific county-wide Value Chain issues and encouraged the formation of institutionalized organizations which are a vehicle for developing a particular value chain.

The actors along a value chain included producers, input suppliers, transporters, traders, processors, and consumers.

During the first phase, the programme in collaboration with the County Governments focused on helping producers organize themselves into groups, supported their linkages to service providers for capacity building and finally linked them to financial institutions and market outlets. The increased technical know-how and subsequent market demand for produce led to an overall increase in yields and improved their incomes.

The programme supported 29 prioritized value chains in the Counties. Each county had an institutionalized Value Chain Forum. To articulate specific issues in the value chain, a total of 143 Value Chain Platforms were formed which gave support to over 17,000 value chain organizations most of the producer groups.

ABBREVIATIONS AND ACRONYMS

Abec	African Bird Eye Chili
ASDSP	Agriculture Sector Development Support Programme
ASAL	Arid and Semi Arid Land
BGAK	Banana Growers' Association of Kenya
CA	Conservation Agriculture
CABESI	Camel Bee and Silk
CBO	Community Based Organization
CIP	International Potato Center
CSA	Climate Smart Agriculture
DVM	Decentralized Vine Multipliers
F	Female
FAO	Food and Agriculture Organization
FY	Female Youth
GAP	Good Agricultural Practice
GG	Green Growth
Gms	Grammes
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KALRO	Kenya Agricultural Research and Livestock Organization
KAPP	Kenya Agribusiness Productivity Project
KCC	Kenya Cooperative Creameries
KCEP-CRAL	Kenya Cereal Enhancement Programme-Climate Resilient Agricultural Livelihood Window
KEFRI	Kenya Forestry Research Institute
KEPHIS	Kenya Plant Health Inspectorate Service
Kg	Kilogramme
KM	Kilometre
KMFRI	Kenya Marine Fisheries and Research Institute
Ksh	Kenya Shillings
KTBH	Kenya Top Bar Hive
M	Male
MCMVCA	Machakos County Mango Value Chain Association

MESPT	Micro Enterprises Support Programme Trust
MoALD	Ministry of Agriculture and Livestock Development
MT	Metric Tonnes
MVCP	Mango Value Chain Platform
MY	Male youth
NARIGP	National Agricultural and Rural Inclusive Growth Project
PPCK	Pyrethrum Processing Company of Kenya
PSP	Participatory Scenario Planning
PWD	Persons Living With Disability
SHG	Self Help Group
SIVCAP	Strategic Integrated Value Chain Action Plan
TATABA	Taita Taveta Banana Producers' Cooperative Society
TCB	Tissue Culture Bananas
VCAs	Value Chain Actors
VCOs	Value Chain Organizations
VSLA	Village Saving and Loan Association
WEF	Women Enterprise Fund

ASDSP II SUCCESS STORIES

1

Excelling in the Meat Goat Trading Business - the Story of Nelson Koech

Nelson Koech, the secretary of Koriema goat traders' self-help group is a trader in the meat goat value chain in Baringo County. The group was registered in 2020 and has a membership of 24 members comprising of 9 men, 3 women and 12 male youth. The main purpose of the group is to improve business participation of members through self-mobilization of financial resources. Under this approach, each member contributes between Ksh. 10,000 and 50,000 as shares which members borrow to undertake business within the meat goat value chain or for any other business.

Nelson's interest in the meat goat trade started while he was still in school. He assisted his parents in selling goats to raise money for his primary and secondary school fees. The knowledge and experience gained during this period spurred him to invest in a few goats with savings from his pocket

money. After form four, Nelson began engaging in buying and selling of goats as a business venture. He started his business with 5 goats which he purchased at an average price of Ksh. 2000 to 3000, later selling them at Ksh. 3000 to 4000 each. As his business progressed, he would make an average net profit of Ksh. 3000 per day. From his profits he was able to save and acquire a motor cycle worth Ksh. 107,000 in 2016. The motor cycle facilitated his business venture since he could source goats from deep hinterland.

Koriema goat traders' self-help group was linked to ASDSP II in 2017. The group was trained on entrepreneurship, record keeping, business plan development and e-marketing. As a youth and a member of the group, this was an eye opener and enabled him to improve his business enterprise. After the trainings he realized that by increasing the number of goats he sold per day, he would improve on his profits.

During the 2020 Covid pandemic, his business faced challenges, but he took this as an opportunity and embraced e-marketing so as to enhance sales. With the improved sales, he was able to take a loan of Ksh. 250,000 to increase his stock of goats and could trade 20 to 50 goats per day. Further, he started aggregating goats and a few cattle for sale in bulk after a while. When the Covid 19 protocols were relaxed and businesses resumed, he was able to sell his goats in bulk and earn good income which enabled him to purchase a pick-up for transportation of livestock.

Currently, Nelson sells 200 goats daily and 10 cattle per week. Normally the average buying price per goat ranges from Ksh. 4,000 to 6,000, however it can range from Ksh. 7,000 to 10,000 depending on the time of the year.



Nelson admiring his goat in the shed

Apart from trading in live goats, Nelson also supplies goat meat to hotels in Koriema centre, as well as in Nakuru and Nairobi cities. Nelson's current operating capital is estimated at Ksh. 2.5 million per month. Besides, he has mentored more than 20 youths in livestock trading and meat business.

Approximately 8 youths are running their own goat trade business after mentorship. Nelson is happy that youths are earning an income from the businesses. Moreover, additional youths are employed in goat meat eateries and not engaging in theft and, drugs and alcohol abuse. He is also delighted that most livestock and meat businesses within Koriema and Marigat are carried out by youth and he attributes this to his inspiration. He is currently worth Ksh. 7 million in 4 years.

Key lessons from Nelson for upcoming Goat traders

- Purchase heavy, disease free and uninjured goats as these will fetch high price, earn good profits than trading with low weight goats.
- Selling goats in bulk fetches more profits in a short time.
- When aggregating goats, ensure your boma is well fenced and guarded to safe guard against theft
- E-marketing is a business booster

2

E-Marketing Changes Fortunes for Youth Group in Tomato



Group members and employees

Tomato value chain is among the three priority value chains being promoted by the ASDSP II. Andy green youth group in Kanduyi sub county, Bungoma County, is among the value chain actors that have been supported by the program. The group started with 7 youth members in 2019 and has since expanded to 25 members. The group is involved in growing, selling and buying of horticultural produce. Their focus was on tomatoes, and

had challenges in supply and demand that resulted in price fluctuations. During the glut period, the demand for the produce especially tomato was low, consequently there were massive post-harvest losses. There was also limited outreach to the consumers especially within peri urban and urban centers. These challenges were coupled with inadequate market information hence the group could not plan both production and supply of tomatoes.

To address the challenges in the tomato value chain, the group embraced digital marketing through use of the website <https://www.andysgreens.co.ke> and social media platforms mainly Facebook: <https://www.facebook.com/groups/267901677963747> and WhatsApp. The group collects and delivers orders to stalls, institutions and to the doorsteps of customers through use of motorbikes.

To enhance tomato value chain development, ASDSP II supported the group with trainings on good agricultural practices in tomato production leading to attainment of GLOBAL Good Agricultural Practice (GAP) certification. Other trainings undertaken included entrepreneurship and business development. In addition, the group was supported with a grant to purchase a tri-cycle. The use of the tri cycle and their motorbikes have enhanced timely distribution of produce hence reduction in post-harvest losses. To bridge the gap between the supply and demand, the group contracts tomato farmers to enhance constant supply to consumers at a fee in addition to assuring a reliable market to producers.



Tri-cycle supported by ASDSP II to help with distribution

The group embraced the trainings on importance of aggregation for business development. As a result, they increased tomato produce aggregated by 60 per cent which translated to 3.5 metric tonnes (MT) per week in 2022 compared to 2.2 MT per week in 2020. As a result of contracting and aggregation of tomato, the prices in the county have stabilized and increased by 30 per cent from Ksh. 40 per kg in 2019 to the current Ksh. 60 per kg. Likewise, there is reduced produce wastage which was at 20 per cent at the traders' premise as a result of increased efficiency in distribution. The interventions by the group have therefore led to enhanced market access, creation of entrepreneurs, enhanced employment and business development.

The group business has 23 permanent employees and 17 on contract offering various services ranging from farm collections, extension services and shop sales. The scope of operations has also increased to cover Webuye and Kimilili towns. The group has recorded a growth in customers served in the last two years by 50 per cent. The number of customers has grown from 180 deliveries in 2020 to 380 deliveries in 2022.

Lesson learned

- i. Technical and business skills while embracing technology are essential for business growth and sustainability
- ii. Group management and education enhances decision making and leadership skills



The group premises/ offices, stores and retail outlet

3

Fortune from Potato Value Chain for Women Group

Light of Kapkochur self-help group is located in Kapkochur sub location, Lelan ward, Marakwet West Sub County in Elgeyo Marakwet County. The group was formed in 2017 and registered in 2019 with a membership of 15 comprising of 6 women, 5 men, 3 female youth and 1 male youth. The objective of group was to support members on financial and social needs, through merry go round, table banking and potato farming using recycled own seed among them '*Tigoni*' variety. The group faced a number of challenges which included but not limited to inadequate knowledge on potato farming business, high incidence of pests and diseases, low yields, poor quality seeds, low market prices and high post-harvest losses that contributed to low productivity and reduced household income.

During public participation fora in year 2018, the group was identified to participate in ASDSP II activities. The service provider trained the group on production technologies namely; soil sampling and testing, land preparation, use of certified seed, planting, earthing up, and pests and disease control. Besides, the group was trained on soil fertility management, crop rotation, dehaulming, harvesting, post production practices and solar irrigation.

Furthermore, the group was linked to financial institutions and similarly training undertaken on business development skills that include market survey, business planning, record keeping, and market intelligence. To address the empowerment of women and youth in the programme, the group was targeted and benefitted with demonstration material for one acre consisting of 16 bags of certified *shangi* variety seed, 100 Kg of fertilizer and assorted agro chemicals. After receiving the training materials, the group was further trained on other production technologies such as use of apical cuttings, surface planting, sprayer calibration, recommended chemical dosage and spray programmes. Following the training by ASDSP, the group realized increased yields of nine MT per acre as opposed to three MT per acre previously. From the year 2021, each member has been planting at least one acre of potato annually using certified and clean seed with average production of eight MT per acre.

Dehaulming in potato production involves removing the aerial parts of a plant after the yellowing of aerial parts which indicates the maturity of the crop. The purpose of the practice is to stop the plant's vegetative growth c, to It is normally done 10-15 days before harvesting. The practice impacts positively on the yield of seed tuber, the post-harvest quality of potato tuber and the disease, pest protection aspect of plants. Three methods are used to dehaulm which include; haulms cutting, haulms pulling and systemic agrochemicals spraying.

The group has been aggregating their potatoes and doing collective sales to their established potato traders in Kimumu market in Eldoret where they sell at an average price of Ksh. 50 per kg up from Ksh.10 per kgs before ASDSP II interventions. This has translated to a gross income of Kshs. 950,000 and profit amounting to Ksh. 684,000 per season that is shared amongst members. Increase in the prices of the tubers can partly be attributed to production of quality produce and aspect of aggregation has enabled the group to have a bargaining power. The group supports its activities from own resource contributions through merry-go-round and table banking where they save and lend among themselves and to other community members.

Other partners who supported the group included Kenya Agricultural & Livestock Research Organization (KALRO), International Potato Center (CIP), Agrico, Sunculture, Cereal Growers' Association and Agromax. These organization supported the group on areas including safe use of agrochemicals, seed storage and solar powered irrigation.



Agricultural officer demonstrating on spacing of potato seed



Regional director of KEPHIS Mr Wachira and team labelling the basic certified potato seeds



Demonstration on soil sampling for testing

The earnings from potato farming business have enabled the group members to diversify into other economic activities that includes peas farming, chicken rearing, and sheep and dairy farming. Through these initiatives members are paired and contribute to purchase sheep or dairy cows for each other. Some members have utilized their potato proceeds to pay fees for their children, build houses, purchase foods for the family and improved members' lives. Additionally, some members have purchase two solar irrigation panels and three motorbikes using income from the sale of potatoes. Currently the group has one acre planted with potatoes, and has planned to increase to two acres of ware potato by July 2023 and one and a half acres of certified seed by September 2023. They also have an intention of increasing the production through acquisition of high yielding potato varieties.

Grace Kipkoech Journey to Affluence

Grace Kipkoech is among the founder members of Light of Kapkochur self-help group and the current chairperson. Her journey of potato farming started in 2013 as a subsistence farmer growing at most half acre of potato. She was using recycled potato seed realizing yield of about 4.4 MT per acre. She experienced numerous challenges ranging from inadequate knowledge on potato production, low quality seed, high cost of inputs and inappropriate application of chemicals resulting in low production and productivity.

After participating in ASDSP trainings, she was quick to adopt the promoted technologies and innovations such as use of diffused light store, apical cuttings, surface planting, and use of new high yielding potato varieties. She has also embraced potato mechanization where she partnered with service provider to acquire a walking tractor and offer ploughing, potato planting and harvesting services.

In seeking market information, she participated in market survey visits to Kimumu in Eldoret, Malaba and Busia mar-



kets. She used the market information to develop her business plan. In the 2022, she planted one acre of seed potato and harvested nine tonnes, which she sold at Ksh.70 per Kgs. This earned her a gross income of Ksh. 630,000 and a profit of Ksh. 450,000 which translates to a monthly income of Ksh.112,500, since the crop takes four month to mature. Currently she has one acres of ware potatoes and she has planned to plant another one-acre of certified potato seed in September 2023 as per her business plan.

Since the 2019, she has been partnering with KALRO Kitale on potato adaptive research on 52 varieties which may be recommended for release and adopted by farmers. As an early adopter of technologies and innovations in potato production, she was recognized and nominated by 'Irish government to represent African potato farmers in the World Potato Congress in Dublin, Ireland in 2022.

Using the potato earnings, she has diversified into other economic activities such as peas farming and sheep rearing. She has improved her house from semi-permanent to permanent and paid fees for her children. She has also purchased her own solar irrigation kit and a walking tractor. As a lead farmer, she has been recognized by the group and the community as the value chain mentor in production of certified seed, offering training and mechanization services on potato enterprise.

4

Empowering Women through Poultry Rearing

Leltiat women group is located in Chelingwa sub location, Mutei Location, Kamariny Ward in Keiyo North sub county, Elgeyo Marakwet County. The group was formed and registered in 2015 as a self-help group with a membership of 27 comprising of 15 women and 12 men. The objective was to support members' financial and social needs, through merry go round, savings, table banking and keeping of local poultry. Currently the group has 19 active members comprising of 3 men, 10 women, 4 female youth, and 2 male youth. One of the adult male is a person with disability (PWD). The group faced a number of challenges which included; inadequate knowledge on poultry rearing as a business, high mortality rate due pests and diseases, poor feeding and housing, inbreeding, and low prices of poultry.

During the public participation fora in 2018/2019, the group was identified to participate in ASDSP II interventions. The group was trained on various poultry husbandry practices in addition to business planning and development, how to conduct market surveys and peer to peer learning. Through ASDSP II innovations targeting women and youth empowerment, the group was supported with 400-day old improved chicks, feeds, vaccines and poultry drugs. The chicks were reared within a member's homestead and acted as a demonstration or learning platform for group members.

Out of the demonstration on proper brooding, recommended feeding and vaccination program, the survival rate at individual farmers improved from below 30 per cent to over 90 per cent. The average maturity period also reduced from between 8 and 12 months to about 4 and 5 months. The members appreciated the fast growth of improved chicks compared to their local breeds that attained an average live weight of 2 Kgs in over 8 months compared to improved chicken that attained same weight within 4 to 5 months.

The group has market linkages with buyers in Eldoret and Nairobi offering average prices of Ksh. 700 per mature bird compared to the previous average price of Ksh.400 for local breeds. The group does aggregation and collective selling of chicken, aggregating 1,270 chickens during the weekly market days and with gross earnings of Ksh. 889,000 since 2021.

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The group was linked to various financial service providers which include women enterprise fund and Uwezo fund. In 2019 the group borrowed Ksh 100,000 from Women Enterprise Fund (WEF). Upon successful repayment of subsequent loans, they have increased their borrowing ability to Ksh. One million. The borrowed funds are subsequently loaned to members who pay back to the group. Through this approach the group has mobilized Ksh. 500,000 through table banking which they lend among the members.



On the Left, Leltiat group members receiving the day old chicks and on the Right their one month old chicks

Mrs Leah Labot, the current group chairperson has benefitted from the group trainings as well as a loan facility courtesy of the group. She is also the group mentor on poultry value chain as she narrated her story:



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Mrs Leah Labot chicken house

Mrs. Leah's journey to prosperity

"My journey of rearing chicken began in 2014 as a subsistence farmer keeping 3-4 hens with the traditional chepkube brooder. I faced many challenges" says Leah, who is also the chairperson of the Leltait women group. "My birds used to die because of diseases and many used to be nabbed by wild animals" she adds

Leah was trained by service providers facilitated by ASDSP II on poultry rearing, disease and pest control, appropriate housing and entrepreneurial skills. She readily applied what she learnt on her farm and is reaping the rewards. "I am now a commercial poultry farmer" she adds proudly.

Leah used a business plan that she developed during the training session to borrow Ksh. 130,000

from Women Development Fund (WEF) to finance her poultry enterprise in 2022. "By end of 2022 I had sold over 765 chicken at about Ksh. 700 per bird after 5 months. My income was Ksh. 535,500 and my profit was Ksh. 294,000." She says adding that at the end of every month she earns just like other salaried persons in the community given that she has staggered her production and the poultry production is not demanding hence acts as an additional farm enterprise.

"I carry my ATM card and walk to the bank where I queue with other salaried and business people. I can buy whatever I desire be it a dress, shoes and support my spouse financially. She adds smiling".

5 Exceptional Profits from Banana Aggregation and Marketing

Kibana self-help group in Kyeni South ward of Runyenjes sub county in Embu County, started in 2008 with 15 (6 male, 7 female, 2 youths) members as a merry go round group. In the 2010, they underwent various trainings offered by the Kenya Agribusiness Productivity Program (KAPP) on banana production and marketing. In the year 2013, KAPP supported the group with an aggregation market shed at Kathageri and linked to buyers. As a result of the assured market and good prices, the group attracted more members and grew to 126 (37M, 81F, 8Y) members by the year 2020. The group was selling an average of 26 MT of bananas per month. This necessitated the group to open another buying center since their outreach area had increased. However, the new area had no sheds and resulted into produce loss as a result of vulgarities of the weather comprising of scorching sun and flood waters.

In the year 2021, ASDSP II supported the group with innovation grants that assisted in construction of an additional aggregation shed at Ngurukiri resulting into handling of up to 40 MT per month and increase in membership to 198 (47M, 141F, 10Y). Each member has an average of 50 banana stools hence group is assured of consistence supplies of bananas. The growth in membership is attributed to timely and transparency in payments that is based on weight of bananas delivered.

The enhanced convenience in banana aggregation by the value chain actors through the aggregation sheds and training of banana transporters, has led to reduced post-harvest losses from 10 per cent to one per cent. On inclusion of youth in banana value chain, a total of 15 transporters (7 motorcycles riders, 7 ox carts owners, 1 pickup) are hired by individual producers to transport bananas to the aggregation centre. Each transporter carries about 6 to 8 bunches per trip earning them kshs. 30 per bunch, which gives a total of 180 to 240 per trip. The ox-cart carries 350 to 400 kgs per trip and are

paid between ksh. 200-250 per trip depending on distance. Two casuals and 3 workers are engaged to grade the bananas at the aggregation center. To enhance accountability and transparency, the group maintains and a summary of group receipts, sales and banana prices per month. The members' delivery records are shared during the group's monthly and annual meetings.

Producers are paid monthly an average of Ksh. 300,000 to 400,000 through Kigumo financial services CBO. Members are deducted Kshs one from each Kilogramme of banana paid that goes to their savings and is paid as dividends at the end of each year. In the year 2022, for example, each member received Ksh. 358,427. In addition to the dividends, members are able to access loans/credit facilities from Kigumo financial services CBO.

Subsequently, the benefits accrued from the interventions have ensured households with improved lives in terms of enhanced food security, improved health, quality education for their children and other social amenities such as good housing infrastructures. The programme has supported the group to establish a tissue culture banana seedling hardening nursery to enhance production through replacing the old stools. The banana aggregation has attracted five key buyers from Nairobi County and the group is assured of good prices of up to Ksh. 18 per Kg from 9 per kg that was previously offered in the year 2019.



Kibana aggregation shed at Ngurukiri supported by ASDSP II




Kibana group members aggregating bananas for sale before support with aggregation sheds

6

Solar Powered-Irrigation Scheme Transforming Wilderness into Green Paradise

Isiolo County is one of the semi-arid counties in the country. The main agro-economic activities include livestock keeping, bee keeping and crop production through small scale irrigation using water abstracted from seasonal rivers. The Malka Bisanadi solar powered value chain organization (VCO) located in Kinna Ward, Garbatulla Sub-county, is involved in the production of vegetables crops using water extracted from Bisanadi river. The group, which began in 2004, is composed of 30 (7 adult male; 14 adult females; 4 male youth and 5 female youth) value chain actors (VCAs). The group is involved in tomato production among other horticultural crops.

Their irrigation system involves extracting water through guided pipes from the river (intake chamber) to a water tank and then to the 7-acre irrigation scheme. The scheme benefits 30 families directly and thousands of other residents in the

surrounding communities. The use of petrol powered generator proved to be expensive because it raised the cost of production leading to low profit margins.

In the year 2021, ASDSP collaborated with the county government and installed a solar-powered irrigation system under the innovation grant funds. This system which uses natural resources, ensures a sustainable supply of water at a lower cost while preserving the environment. Through ASDSP, the group was trained in nursery preparation and management, land preparation, transplanting, weeding, crop protection, staking, post-harvest techniques, record keeping, business plans, market linkages and financial management for various high value horticultural crops.

As a result, productivity for tomatoes, one of the crops grown by the group increased from 25



ASDSP II Supervision mission during installation of Piping and water tank provided through ASDSP II innovation grant



crates to 120 crates per acre resulting in high profit margins for the VCO. Secondly, there is a consistent supply of tomatoes in the market throughout the year as they are able to supply 14.4 MT per year through rainfed and irrigated crop systems. Furthermore, through ASDSP trainings, the group has diversified their agricultural enterprises to fish farming, beekeeping, and fodder production.

Training on entrepreneurship improved the group's record keeping, business development and financial literacy which led to the formation of the Village Savings and Loan Association (VSLA) and the Nasole Savings and Credit Cooperative Society, which now has 40 members. The savings group has two permanent employees (one adult male and one youth male) and 18 temporary employees (3 adult males 8 adult women, 4 youth males, 3 youth females). Finally, the solar-powered pump has increased irrigation efficiency by reducing the amount of time required to irrigate the farm from 2 hours to 30 minutes and the labour required from 2 people to 1 person. The solar power initiative has created a small green paradise in the midst of the wilderness. '*Something positive has emerged from the arid and semi-arid zone (ASAL)*'.



Tomato crop established through drip irrigation.

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Empowering Farmers through Dairy Farming and Value Addition

The Kabianga Farmers' Cooperative Society Limited was established and registered in 1964. It is located 25 kilometre (KM) from Kericho Town in Kericho County. The cooperative currently boasts of 4,484 registered members, comprising 1,166 male adults, 1,480 adults female, 1,211 male youth and 627 female youth and 22 persons with disability (PWDs). This diverse membership base reflects the cooperative's commitment to inclusivity and creating opportunities for all stakeholders. The cooperative is a well-established organization that focuses on supporting dairy farmers in the areas of milk collection, cooling, and marketing to improve their economic prospects.

However, the cooperative was mismanaged, received low milk volumes, and offered poor milk prices that resulted in its collapse in the 1980s. Despite facing significant challenges in the past, the cooperative managed to revive itself through

successful initiatives. With the support of the County government and the ASDSP II initiative, the cooperative has made remarkable progress in enhancing the dairy value chain in Kericho County. In 2019 years, the cooperative received support from the county government and the ASDSP II to improve its leadership, management, and overall business operations. With this assistance, the cooperative has developed a business plan and strategic plan for the period 2021-2025, which serves as a roadmap for growth and sustainability.

The Kabianga Farmers' Cooperative Society has defined key result areas to focus on to enable it to achieve its objectives. The result areas identified to improve productivity entail offering training, promoting better breeding practices, and encouraging members to practice better animal health. The Cooperative Society is committed to raising the amount of milk that its members supply while

ensuring that high standards for milk quality are upheld. Thus, it provides information and tools on safe milk handling and storage. It invests in creating the required infrastructure and installing cutting-edge machinery because it understands how important it is to expedite milk collecting, processing, and storage.

Moreover, the cooperative actively works towards securing market access for its members' milk products. Farmers can negotiate better prices and increase their income through establishing relationships with processors and facilitating trade. It promotes inclusivity by involving youth, women, and vulnerable groups in various aspects of the dairy sector, creating opportunities for economic empowerment and ensure sustainable livelihoods. It prioritizes strong leadership and integrity in its operations by fostering a culture of good governance, transparency, and accountability, ensuring efficient and ethical management of the cooperative.

The initiatives undertaken by the cooperative have had a profound impact on farmers and their access to the market. Through bulk milk collection and selling to a single processor, farmers benefit from improved price bargaining power. The buying price of one litre of raw milk rose from Ksh. 38 to Ksh. 52 due to the cooperative's efforts, providing better returns for farmers. The cooperative's activities have created both direct and indirect employment opportunities for the local community and generating jobs across the entire dairy value chain. Kabianga Farmers' Cooperative Society has ventured into value addition by producing yogurt and '*mursik*' which is the Kalenjin sour milk. These



Feed production supervisor at Kabianga farmers cooperative society

value-added products are sold in local markets, offering additional income streams for the cooperative and its members.

ASDSP supported training of management of the cooperative, value chain actors and service providers. The yield of milk for farmers increased from 5 litres per day to an average of 7 litres per day per cow. Consequently, the number of qualified service providers rose from 5 to 23 after the trainings. The cooperative was assisted by ASDSP with a feed mill, feed mixer, bag sealer, and weighing scales. This intervention lowered the prices of the dairy meal from Ksh. 3200 (50Kg) bags to 2850 (50kg) bag. The institution also benefited with a feed analyzer (Aflatoxin tester, grinding machine, analytical balance, desktop for instruments, potential of hydrogen (PH) meter, polygrid test tubes), and laboratory reagents and equipment. By use of the aflatoxin, coupled with good sanitary measures, there was a notable reduction of aflatoxin in the dairy meals from 20% to less than 10%. Through this intervention, the consumers are assured of safe milk.

The success story of Kabianga Farmers' Cooperative Society Limited stands as a testament to the power of effective interventions, strategic planning, and collaboration. By empowering dairy farmers, the cooperative has not only uplifted their lives but also made significant contributions to the local community and the entire dairy value chain. With continued support, Kabianga Farmers' Cooperative Society is poised to achieve even greater heights, becoming a beacon of inspiration for other cooperatives and agricultural organizations across the country.



Conservation Agriculture Impacts Positively on Maize Yields

Maize is one of the most widely consumed and produced staple crop and is therefore critical to food security in Kenya. However, nationally the yields have declined from 2.2 metric tonnes (MT) per hectare (ha) in the 1990s to 1.27 MT in 2018 (MoALD 2019), largely as a result of declining soil fertility, high incidences of pests and diseases as well as low market prices.

Maize value chain is among the four value chains supported by the programme in Bomet County. The crop is mainly grown in the drier parts of the County namely, Bomet east, Bomet central, Sotik, Chepalungu and Konoin sub counties on either large-scale commercial farms or small holder plots. The continuous tillage of crop fields with tractors and draught animals has led to poor soil structure due to compaction of soils which affects proper root development ultimately affecting yields. These challenges compounded with pest and disease mainly maize lethal necrosis disease (MLND) significantly reduced the area under maize from 22,463 Ha to 17971 ha (Bomet County Department of Agriculture 2018)

Conservation Agriculture (CA)

Conservation agriculture is a farming system that promotes minimum soil disturbance (i.e. no tillage), maintenance of a permanent soil cover, and diversification of plant species. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production

The Programme interventions in the maize value chain mainly focused on the three principles of conservation agriculture (CA) namely; minimum tillage, crop rotation, and maximum soil cover. The major rotational crops for maize are beans, pumpkins butternuts and sweet potatoes thus enhancing CA and improving crop nutrition. These crops also act as cover crops with benefits such as soil moisture retention, weed suppression and

reduced soil erosion and leaching, besides enhancing soil fertility. Through the programme, 54 groups have been trained on CA out of which 32 have implemented the practices.

One such group is Kapsoyo Community Based Organization (CBO), based in Silibwet township, Bomet Central, comprising 26 members (8 adult men, 16 adult women, 3 youths). After implementing conservation agriculture, during the first season, the group members reported increase in yields of 20 (90kiligramme (Kg)) bags per acre as opposed to 4 to 7 (90kg) bags using conventional methods. In the second season, the yields increased to 25 (90kg) bags per acre.

David Turgut Excels in Maize Production



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David Turgut from Lelaitich soil and water conservation group, sigor ward, Chepalungu Sub-county, begun implementing CA in the year 2020 and his maize yields have increased every season. His first harvest increased from 4.5 (90kg) bags per acre to 9.5 (90kg) bags, doubling in yields to 18.8 bags per acre in his second season harvest in the year 2021.

David Turgut from Lelaitich soil and water conservation group, sigor ward, Chepalungu Sub-county, begun implementing CA in the year 2020 and his maize yields have increased every season. His first harvest increased from 4.5 (90kg) bags per acre to 9.5 (90kg) bags, doubling in yields to 18.8 bags per acre in his second season harvest in the year 2021. During the dry spell of December 2022 to end of March 2023, he harvested maize and pumpkins due to improved soil moisture retention, while his neighbours experienced crop failure. After experiencing the benefits of CA, he has increased his acreage of maize under CA to 1.5 acres from 0.5 acres. The proceeds from the maize have led to improved livelihood and assisted him to pay school fees for his children

The experience gained by the farmer and benefit accrued from the practice, he is a trainer for other farmers and among them 32 CA champions being mentored by the programme. As a result of his efforts, 26 maize producers are implementing conservation agriculture in sigor Ward.



Minimum tillage for conservation agriculture



A good maize crop grown using CA approach, ndani ward, Sotik sub county



A good pumpkin crop used as a rotational crop in CA

Creating Job Opportunities through Mentorship on Fingerling Production and Marketing

Mr Muga is a member of Kimira B1 self-help group in Rachuonyo North, Kibiri Ward, Homabay County. His group was registered in the year 2010 with 25 members (12 men, 8 women and 5 youths). The programme (ASDSP II) supported the group with aquaculture production trainings, mentorship, business development and linkages to various projects and institutions such as Aquaculture Business Development Project (ABDP), Food and Agriculture Organization (FAO), Jewlet Enterprises, Food-tech Africa, Lattice Aqua, Aquaculture Society of Kenya, Kenya Marine Fisheries and Research Institute (KMFRI) and to other Value Chain Actors. This has enabled them to create opportunity for expansion of the enterprises such as hatchery and fingerlings production. The group has partnered with Aquaculture Business Development Project in the promotion of the fish production in the county.

One of the group members, Mr. George Muga has taken up the trainings and mentorship at a notch higher. He underwent incubation and mentorship programs provided by Mr. Were of Jewlet Enterprises after which he established fish production at his farm. The farm has a capacity to produce about 6 million fingerlings per month but currently producing about 1.2 million fingerlings worth Ksh. 3.6 million per month by year 2022. He has expanded the scale of operation from 20,000 in 2013 to 300,000 fingerling per week. The farm started with 4 fish ponds in 2010 when he joined Kimira B1 self-help group and by end of year 2022 had 57 ponds for nursing, brooding and production.

The farm has employed 8 permanent workers and about 11 workers on casual basis. The farm engages the youth as interns and students on attachments on annual basis for hands-on trainings to acquire experience on the fish hatchery management. Two (2) youth groups, Kendu Aquaculture youth Group and Kimira youth Group have also undergone practical trainings and acquired skills on ponds construction. The members of these two groups have commercialized the practical skills they got from Mr. Muga on digging up raised fish ponds. They offer the service of constructing the

fish ponds at a fee Ksh 40,000 for earthen ponds & 30,000 for raised ponds.

The proprietor Mr. George Muga also has mentored a number of VCAs into the hatchery management and nursing of the fingerlings. Currently, more than 12 fish value chain actors have been mentored on nursing of the fingerlings to around 30gramme (gm) 50gm, an activity which is readily being taken-up by the youths and women in the fish value chain. Other producers, about 30 are also being supplied with about 20,000 fingerlings to nurse from 5gms to 50grammes (gms) before selling to the producers in both ponds and fish cage producers.

The farm also acts as a marketing channel for all its products, cooked fish, fingerlings, post-fingerlings and harvested mature fish. The farm does purchase back all these products from its members and find a market for them within and outside the County. The nursing famers are supplied fingerlings at Kshs. 3 and then sells back to the farm at Ksh. 7, thus each of the 30 famers are able to earn Ksh. 80,000 per month from the sales of fingerlings. The fish producers also do harvest and take their produce to the farm for ease of marketing. Through the activities of the farm on skills development and mentorship more entrepreneurs have been created and food and nutrition security improved at the farm level. The farmer, Mr. Muga has perfected his skills in aquaculture and through linkages with ASDSP II he is consulted for practical skills to other counties namely Kisumu and Migori. Mr. George Muga can now testify to be a millionaire from the fingerling production business.





Egg harvesting from the happa nets, the hatchery and Lined dug-up pondat Mr. Mugas farm

The post-fingerlings sizes are one of the innovations that reduces the maturity period for the producer to four months thus enabling two harvests per year. This also gives the producer an advantage over the predators since bigger fingerlings are not so much prone to the attacks. The income to fish farmers stocking the 50 gms fingerlings and harvesting twice a year has improved from an average of Ksh. 65,000 in a pond of 900 metres square to Ksh. 180,000 per year. The liners are used in the areas where the soils are porous hence cannot retain water on a bare ground while the use of green-house in fish production, is a technology where fish growth is enhanced due to the raised temperatures.

10 African Bird Eye Chili Farmers Reap Benefits after Introduction of Solar Dryer

KWALE

Martha Wambua is a youthful African Bird Eye Chili (ABEC) farmer from Kwale who belongs to Matokeo women Group. She started the African Bird Eye Chili production in 2012 and would sell her fresh produce to Equator Kenya Limited based in Kilifi for further processing. However, due to high cost of labor, about 50 per cent ripe produce would remain unharvested leading to high post-harvest losses. She currently grows Demon F1 variety of chili in her one acre land. To address the challenge, the programme introduced solar driers to the group where Martha is a member. This allowed each producer to pick their African Bird Eye Chili (ABEC) on a daily basis for bulk drying then sell the dried produce to buyers every week.

Martha proudly says "I can now comfortably harvest 100 per cent of my chili over one week. "As a result, my sales from chilies have jumped from 200 kilograms to 400 kilograms per week."

Benefits of the solar drier

- Dries 2 MT of ABEC chili per week
- Post-harvest losses associated with fresh chili spoilages has reduced from 10 per cent to one percent
- Increase of 40 per cent in the number of women selling dried chili from the group and its environs to the Mombasa and Nairobi markets.
- Increase in household income which to KES. 64000 per month from sale of 1.6 tons of chili monthly up from 0.4 tons which could only bring this household Kes. 16000 per month.



Martha Wambua, Chairperson of Matokeo women group, show casing solar drying of ABEC chilli



An outside view of the 2 MT per week solar drier established at Matokeo Women Group in Kubo South, Kwale County

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Fortunes of Kigato Youth Group increases after Embracing Technology

Kigato youth group, located in Waa Ngombeni, Matuga subcounty, Kwale County, was registered on 2008 and has a total membership of 20 (8male youth, 7 female youth and 3 adult males and 2 adult females. Besides, running a local chicken project, the group also provides cleaning services to nearby institutions including Kenya School of Government in Matuga and Waa dispensary. Their local chicken project has been running since 2010 and has evolved over time to artificial incubation of chicks and sale of day-old chicks.

As one of the beneficiaries of ASDSP II programme, the group has benefitted from various training activities. These trainings are; business plan development, green growth and climate smart technologies in indigenous chicken production, health management and bio-security, incubation and brooding management. Other training conducted were on feed formulation, markets and marketing strategies for live chicken and eggs.

The group was among the targeted beneficiaries of the programme's innovation grant through which they received feed miller and feed mixer with a capacity of one MT per hour and half MT per hour respectively. A member of the group, was sponsored by the programme for a week training on feed formulation and milling technology at Dairy Training Institute Naivasha. With this additional support, the group will be in a position to improve their ongoing local chicken project through access to quality feeds. Additionally, the group is now able to earn incomes from sale of feeds to group members as well as to near nearby farmers. The feed milling unit has also provided employment to other 2 members of the group who work on part time basis. Currently, the group earns a gross profit of Ksh.144,000 from the sale of day-old chicks and Ksh. 659,500 from the feed milling business which translates to per capita income of Ksh. 659.



Kigato Youth group chairperson explaining feed milling process to members



The Karinga group Hardening Nursery of 2000 TCB seedling

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Banana is a leading cash crop like tea and coffee in Kirinyaga County. The success of the banana value chain is attributed to interventions by ASDSP and other value chain actors that focus on addressing key gaps along the value chain.

Although banana is an important value chain in the county, a number of challenges are experienced by value chain actors along the chain. These include uncoordinated producer groups and marketing structures; inadequate market facilities; exploitation by middlemen; high cost of Tissue Culture Banana (TCB seedlings); inadequate production and value addition skills; poor post-harvest handling; poor quality planting materials; weak linkages to service providers and poor road infrastructure.

Karinga Self Help Group in Kirinyaga County, Kirinyaga Central Sub County is a marketing group which was formed in October 2010 to address low yields in banana production and marketing. The group's potential was identified under ASDSP in 2013 and through the project's interventions, Karinga SHG was registered under the Department of Social Services. The group started with an initial membership of 20 but has grown to 67 members to date. It started as an agro producer group whose main activity was TCB production. The group was trained on appropriate agronomical practices by the County Agricultural Extension

department which led to an increase in the yields realized among the members.

With the increased supply of bananas, marketing the group's produce became a challenge. Brokers took advantage of this by engaging the members individually and making offers for their produce which was as low as Ksh. 250 for a bunch of a banana weighing on average 30 Kg.



Group chairperson admiring her banana



Karinga SHG aggregation of banana produce awaiting to be taken to group collection center

To address this challenge, the group was registered under the Banana Growers Association of Kirinyaga (BGAK) whose purpose is to organize registered self-help groups to assist them market their bananas more efficiently by sourcing for markets. Through BGAK and ASDSP support, the group has been able to aggregate bananas at designated points where buyers collect sufficient volumes thus reducing the buyers need to move around collecting bananas. To reduce post-harvest losses during transportation, trainings banana handling is offered to transporters and producers. The group officials negotiate for better prices with traders and sign marketing agreements with buying agents.

Through this arrangement, the Karinga SHG has been able to supply agents as far away as Githurai Open Market in Nairobi. Their weekly sale is 15 MT (15,000 kg) at Ksh.12 per kg amounting to Ksh.180,000 and a monthly income of Ksh. 720,000. A bunch has an average of 40kgs therefore in the formal market it fetches Ksh 480. Previously the same bunch only fetched Ksh.200 at farm gate and ksh. 250 at offered by broker at the market.

The group's chairperson attests that due to better incomes from the sale of bananas, the members' living standards have improved. In addition to this, members have been linked to Equity Bank Kerugoya branch for provision of credit facilities

guaranteed by the group and accesses through their mobile phones. Members also engage in table banking activities whose interest payments benefit all the group members.

In 2020, Karinga SHG together with other groups affiliated to BGAK were taken through a lobbying skills and proposal writing training supported by ASDSP. As a result of this training the group became a beneficiary of a Tissue Culture Banana (TCB) hardening nursery with a capacity of 2000 seedling from Jomo Kenyatta University of Agriculture and Technology and KALRO. The current cost of TCB seedling is Ksh. 120, the group gets an approximate gross earning of Ksh. 240,000 per season from the business venture.

Through group aggregation, Karinga SHG is now able to access market information through Kenya Commercial Bank market information App, WhatsApp and the marketing department of Kirinyaga County. Members are able to monitor information on banana prices in urban markets outside the county. To enhance value addition, the group was identified alongside 3 others to start banana value addition initiatives during the periods of glut. They started with processing of banana crisps. Through ASDSP II innovation grants, the group has been supported with solar driers to enhance banana processing capacities.

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Rewarding Results of Cooperation



Kangari United Dairy society building that they have put up and moved from leased premises

The dairy industry in Murang'a County had for a long time, many challenges that threatened to cripple the enterprise. Farmer's milk yields were as low as three litres of milk per cow per day due to limited knowledge on animal husbandry practices. Milk marketing was done individually or in small groups to New KCC, Brookside Dairies, Aspedos, brokers and hawkers who offered the producers prices ranging from Ksh.18 to Ksh.20 per litre depending on the season and availability of milk. The income was not guaranteed because the flow of cash to the producers was very erratic and unreliable. The buyers delayed the payments since the individual farmers did not have a voice to air their complaints. As a result, farmers who had high potential in milk production neglected the enterprises due to the low gross margins and subsequent low incomes.

To address these challenges, the county government and other stakeholders intervened to streamline the dairy sector in the county. The cow milk value chain was prioritized by the county government and ASDSP 1 after recognizing the robust potential of the dairy industry in the County. The County Government promoted the formation of groups and cooperatives while ASDSP participated in the much-needed community mobilization and training on leadership and governance of the newly formed groups and cooperatives.

The Kangari United Dairy Cooperative began in 2014 with a membership of 79 (45 M and 34 F)

members through the Intervention of the County government and ASDSP I together with other key stakeholders. The objectives of the cooperative were to improve the milk production of the members through training and secondly to market milk for the members and reduce reliance on middlemen who exploited the farmers. This in the long run would reduce costs, lower losses and increase incomes for the farmers.

The Dairy Cooperative has since inception been sourcing for milk markets for the members as well as aggregate milk at farm level and transports it to the cooperative premises for cooling before transporting it to milk processors. In addition to milk, they also source and sell quality feeds including hay to the members. The feed business has performed so well that the cooperative has rented 17 acres of land where they have planted super nappier grass on 7 acres and nutrifeed forage millet on 10 acres for making hay and silage.

Through ASDSP II, the cooperative members have benefited from trainings on leadership, governance, entrepreneurial skills, marketing and market access. Other, trainings were on climate smart agriculture (CSA) and green growth (GG) technologies and on technical issues on dairy production thus increasing their production and quality of milk. In addition to this, the cooperative was provided with a silage bailer, chopper & generator through the programmes innovation grant. This initiative has reduced the cost making feeds and now they are able to supply the baled silage to their members at only a reduced price.

Kangari United has made tremendous progress over the years. The number of registered producers has increased from 79 in 2014 to 1776 (900M, 680F,196Y) in 2023. Milk aggregation has increased from 405 litres per day totalling 145,825 litres per year valued at Ksh3.4 million per year in 2014 to 17,500 litres per day totalling 6.4 million litres per year valued at Ksh.313 million by mid 2022. However, due to the drought experienced in the second half of 2022 spilling into the year 2023, there was a drop in delivery to 16,500 litres per

day amounting to 6 Million litres per year valued at Ksh.288 million. The net payment to farmers for their milk delivery has also increased from Ksh.23 per litre to Ksh.48 per litre whereby on average an individual member delivers 12 litres per day translating to Ksh. 576 per day; an average earning of Ksh.210,000 per year. Milk yields at farm level has also increased as farmers are able to feed their

animals with concentrates and silage supplied by the cooperative from an average of 3 litres per day in 2014 to the current 10 litres per day.

The cooperative has become a source of employment for 24 local youth transporting milk using motorbikes as well as employing some permanent staff members. The cooperative uses ICT in its transactions;

The Changed Fortune of Jimna Kamau

Jimna Mugambi Kamau, a member of Kangari United Cooperative from Ngurweni Village has had his fortune changed since joining the cooperative in 2014. Prior to that, Mr. Kamau had two dairy cows that produced an average of 15 litres of milk per day. This he sold to middlemen at between Ksh.18 to Ksh.20 translating to Ksh.300 per day depending on the days negotiations. Sometimes the middlemen would take his milk and promise to pay him later after selling the milk but they would not keep their promise. The cost of rearing the animals was high as he could hardly break even given the high cost of feeds. This discouraged him to a point when he felt like giving up on dairy production.

In 2014, Mr. Kamau joined the Kangari Cooperative after learning about it at a community barasa. Through the cooperative, he was trained on how to rear dairy animals especially the feeding regimes. He was able to increase the yields of his two animals to about twenty litres per day after buying and feeding the animals on hay, silage and concentrates from the cooperative. In 2020, the farmer, through linkage to a financial institution increased the number of his dairy cows to 4 and was able to sell 60 litres of milk per day. He was paid Ksh.33 per litre giving a total of Ksh.1980 per day. From the year 2020 to date his production has increased to an average of 80 litres per day from the same 4 cows where his highest producer is at 31 litres per day and his lowest at 17 litres per day. Mr. Kamau is currently being paid at Ksh.48 per litre which is Ksh.3840 per day, earning him an average gross income of Ksh1.4 million per year.

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Automated silage baler being off loaded at Kangari United Dairy Cooperative



A youth off-loading milk and the cooperative premises

Improving Living Standards through the Beef Value Chain

Inaanyora Women Group, located in Melelo ward, Narok South Sub-County, is a community-based group that seeks to improve its members' economic wellbeing. The Agricultural Sector Development Support Program supported the group of 18 members as a beef Value Chain Organization (VCO) in 2014. During that year, the VCO was fattening five steers for one and a half to two 2 years purchased at Ksh. 10,000 to 15,000 and sold at Ksh 20,000 to 25,000 earning the group approximately Ksh .100,000 to 125,000. This resulted in low incomes from the enterprise due to the long waiting period. Initially, the group had financial challenges because of long waiting times and inadequate breed selection for fattening. ASDSP supported the group with trainings on steer fattening; breed selection; pasture production; and disease management.

The group took up bull/steer fattening as an opportunity for business venture. In the year 2016, the number of steers was increased to 16, and the fattening period was reduced from a year to just six months out of the trainings they had received. By selling these steers for an average price of Ksh. 40,000, they earned an additional Ksh. 640,000 per cycle. Encouraged by their success, they increased their herd to 36 steer/bulls for fattening in 2020 and earned approximately Ksh .1,440,000 per cycle. The group got an innovation award to improve on feeds from ASDSP II in 2021. The fund facilitated establishment of pastures on a two (2) acres land through procurement of the following inputs: Boma Rhodes seeds, desmodium seeds in addition to planting and top-dressing fertilizers.

The impact of the advancements made by the Inaanyora Women Group in the beef value chain extends beyond their immediate financial gains. They have been able to utilize their increased earnings to address various other needs within the community. Each member has been able to purchase two Sahiwal cows and have learnt how to establish and manage pastures from the demonstration of the two acre group plot. From the earnings of the value chain, the group aggregates funds and pays the National Hospital Insurance Fund annually for all its members. The members are no longer bur-

dened by the high cost of healthcare thanks to this initiative. The VCO has set up a table banking fund that offers loans between Ksh. 10,000 and 15,000 to approximately 150 people in the community hence extending beyond the group members. The 10 per cent interest charged on the loans have supported a variety of income-generating group activities as well as earning members annual dividends of up to Ksh. 20,000.

The group aims to increase the number of steers for fattening from the current 36 to 50, further enhancing their income generation potential. They plan to establish 10 acres of Boma Rhodes and 1 acre of desmodium/lucerne, improving their pasture resources and ensuring sustainable feed supply for their livestock. The Inaanyora Women Group hopes to create a more prosperous and robust community with higher living standards and more job opportunities for its members.

The Group's journey in the beef value chain showcases the power of training, innovation, and collaboration in transforming livelihoods. Through their hard work and determination, they have not only improved their own economic circumstances but also uplifted the entire community. Their story serves as an inspiration for others to explore and harness the potential of agriculture and value chain development in their own contexts.



The Inaanyora Women's Group is being trained on feed formulation

15 Embracing Appropriate Technologies and Mechanization for Higher Returns



Nyeri County Governor, His excellency, Mutahi Kahiga handing over s to ASDSP II value chain organizations innovations supported by Agriculture Sector Development Support Programme

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Kiambogo Kianjogu self-help group was formed in 2014 under ASDSPI with an objective of increasing the productivity of Irish potatoes. The group is in Kiambogo, Mugunda ward in Kieni West Sub-County, Nyeri County. The group has a membership of 25 (10 adult males, 10 adult females, 4 male youth and 4 female youth). The geographical location of the group restricts the group to farming horticultural crops where Irish Potato is their main crop.

The challenges that the members were facing in Irish potato production forced them to form a group for capacity building. They were trained and adopted various technologies including use of clean seeds, use of earthing-up technology, dehaulming and integrated pest management. Earthing up refers to the act of heaping soil around the root zone of the potato plant. Dehaulming is the practice in which aerial parts of a plant are removed 10-15 days before harvesting, and can be done after the yellowing of aerial parts because yellowing of the vine indicates the maturity of the potato. Dehaulming is one of the pre-harvest practices which are aimed at hardening the skin

of the tubers and therefore reduce injuries during post-harvest handling. From practicing lessons learnt subsequently, potato production increased from 132 bags to 176 bags (50Kgs) per acre and generally the potato quality improved. The gross margins improved from 19 percent to 33 percent with the per capita income increasing from Ksh. 65 to Ksh. 131. The increase in production and improved quality of potato has enabled the group access contract market with processors. The group has been selling 10 tons per month to Wedge Hut Company.

In 2022, the group identified walking tractor as an innovation that would reduce the cost of labor in Irish potato production. ASDSII supported the group with a walking tractor alongside ploughing, ridging, planting and harvesting implements. The walking tractor is hand operated and aid the value chain actors in undertaking activities that would result in increased production. The farm machinery for each group included an 18.5 Horse power tractor equipped with a double disc plough and potato harvester.



Land harrowing using the hand tractor



Land harrowing using the hand tractor

To ensure sustainable use and maintenance of the machinery, the group hires out the walking tractors to group members and neighboring farmers. For ploughing, the charges are Ksh. 3,000 per acre whereby Ksh. 1,200 is reserved for tractor maintenance, Ksh. 800 to the operator and his assistant and Ksh. 1,000 to the group savings account. The walking tractor has a potential of ploughing three acres of land per day. For hallowing, the charges are Ksh 1,500 per acre whereby Ksh. 600 is reserved for tractor maintenance, Ksh. 500 to the operator and his assistant and Ksh. 400 to the group savings account. The walking tractor has a potential of hallowing six acres of land per day. For hire to harvest potatoes, the charges are Ksh. 1,500 per acre whereby Ksh. 600 is reserved for tractor maintenance, Ksh. 500 to the operator and his assistant and Ksh. 400 to the group savings account. The walking tractor has a potential of harvesting three acres of land per day.

The operators on average undertake ploughing, hallowing, ridging and harvesting on 30 acres for both group and non-group members. The operator earns Ksh. 75,000 per the 3-month season giving a total of Ksh. 225,000 per annum. On average the operator earns Ksh. 25,000 per month whereas the assistance earns 12,500 per month. Other indirect job creation consists of walking tractor repairs, high demand of spares and increased sale of fuel from petrol station to operate the tractor.

Therefore, the equipment has been generating income for the group as well as creating employment to the operators. Use of walking tractors by groups members has resulted in reduction of ploughing cost from Ksh. 3,200 to 1,800 per acre that translate to 40 per cent whereas the hallowing cost by 49% thus a decline from Ksh. 1,600 to Ksh. 810 per acre thus a reduction by 49%. Moreover, harvest costs were cut down from Ksh. 13,500 to Ksh 5,000 per acre hence a reduction by 63%.

Additionally, the post-production losses of potato tubers associated with harvesting have declined from 20 to 5 per cent. It is estimated that the total production costs from the 30 acres the group is growing potatoes is 240,000 (50kg bag), thus the saving is 120 (50kg bag). Each 50kg bag is sold at Ksh. 2000 thus the total saved is Ksh 240,000 per season. Hence on average the group is able to increase their incomes by Ksh. 480,000 for the two-potato growing season through reduction in post-harvest losses.

The group has plans to expand and manage their production systems to increase the supply of ware potatoes per month from 10 tons to 20 tons to processors among them Wedge hut and Viasi King limited on contractual basis. Furthermore, the group envisions to add more tractors to offer comprehensive mechanization services to small scale farmers in the region, for additional incomes and employment creation. Embracing mechanization is expected to increase the ease of agricultural production, thereby attracting more producers. This would lead to increased incomes from farming, increased purchasing power and greater demand for the group's mechanization services.

Some of the group members testifies on the benefits accrued from adoption of mechanization as madam Alice Wanja narrates:

Alice Wanja Kahando, beneficiary from Kiambogo Kianjogu SHG:



Alice Kahando in her potato crop

"The year 2017 was when I hit my jack point after harvesting 120 bags from an acre of Irish potatoes. Through ASDSP training, I stored the ware potatoes awaiting price stabilization. I sold after three months at Ksh. 5,000 each thus generating Kshs 600,000 in one season. This convinced me that Irish potato production can be commercialized when the right strategies are put in place"

I started Irish potato production, besides other crops like, maize and beans in 1999. The production of Irish

potato was 25 (110Kg) bags, and annual income of Ksh. 112,000 while the daily per capital income was Ksh. 61. I joined Kiambogo Kainjogu self-help group in 2016 which was formed under ASDSPI in 2013. I was trained on strategies to improve productivity of Irish Potatoes through adoption of good agricultural practices and use of effective, efficient, climate smart agriculture and green growth technologies, used manure and clean seed. Potato production increased from 20 to 40 (110 Kgs) bags.

This changed my mind set and realized potato can be commercialized. In 2017, I planted one acre of Irish and harvested 120 bags (110Kgs). With the knowledge acquired from ASD-SP, I stored the whole consignment until the price stabilized, which I later sold a bag at Ksh. 5,000 generating revenues of Ksh. 600,000 and the cost of production was Ksh. 100,300. This motivated me to continue improving my production system as well as expanding the economies of scale. In the same year, I managed to buy two acres of land thus increasing the acreage under Irish potatoes to three acres. The proceeds from the commercial Irish Potato production enabled me to purchase two dairy cows and 20 Hampshire sheep.

I have an average production of 100 (110 Kgs bag) per acre which is sold at stable market of potatoes at Ksh. 2,000 per bag. The dairy cattle herd had grown to 8 and the number of sheep has increased to 100. Alice has an average Irish potato production of 100 bags (110 Kgs) per acre, cost of production of Ksh. 100,300 per acre and a at Ksh. 2,000 per bag. The dairy cows heard have grown to 8 with an average production of 15 litres per cow while the sheep's heard has increased to 100. The 30 MT of manure from these two enterprises resulted to decline in inorganic fertilizer used. I have also acquired a pick-up worth Ksh. 700,000 which assists in transportation of inputs and produce.

The farm is installed with irrigation water from Gataragwa irrigation water project which reduces crop losses risks associated with inadequate rains. Total annual income from the farm is Ksh. 2.3 million and the cost of production is Ksh. 1.4 million thus a profit of Ksh. 900,000 per annum. This has enabled me to educate my two daughters up the university level and one is currently in form three. Moreover, I have improved my house, installed electricity and installed a fence around the homestead for security reasons.

16 Adoption of Improved Technology Transform Lives of Women

Setion self-help group is located in Lelan location, West Pokot County. The group was formed in 2010 and registered in 2011 with the Department of Social Services. The total membership of the group is 15 (10 adult male, 5 adult female). It was formed with the aim of utilizing forest resources and to diversify income streams through beekeeping farming. During this time, the groups had no markets for honey though some group members had up to 50 log hives installed in the forest. The honey harvested was consumed at home or given free to friends or relatives.

ASDSP II supported capacity building of the group through Camel Bee and Silk (CABESI) service providers, and County extension staff. The group members were trained on improvement of the log-hives, apiary management, honey harvesting, post-harvest management, and processing of honey. Honey harvesting from the traditional log-hives was challenging for members as the process involves harvesting the brood thus, lowering the quality of honey. It also delays the next cropping as bees would take long to reconstruct the colony. The groups were therefore encouraged to install hives that separate the brood and the honey. Members were accustomed to the use of log-hives, so to improve the quality of honey, traditional log hive which had a queen excluder fitted at a third of the length of the hive was introduced to the group.

Alongside promoting the improved log hive, ASDSP II also advanced the use of other modern hives like the Kenya top bar hive (KTBH) and Langstroth. However, the community readily adopted the log hives as opposed to the modern because they were cheaper to make/purchase.

So far six group members have adopted the modern hives while the other group members have installed the improved log hives. The traditional log-hive produces about five to 10 Kgs of honey depending on size of the log. The improved log hive produces the same amount but cleaner and higher quality honey as the brood is not mixed with honey during harvesting. On average, each group member has five improved log-hives. The cost of introducing the queen excluder in the existing log hives is Ksh. 250. Presently, the artisans sell traditional hives at a minimum of Kshs. 200 shillings and a maximum of 2,500 depending on the size while improved log-hives are sold at between Ksh. 2,500 and 4,000 shillings depending on the size.

The improved log hives and modern hives have increased the amount of honey produced by the group resulting in the production of honey combs that can be used in the centrifugal honey extractor. The group felt that they needed a centrifugal honey extract since the buyers required semi-refined honey and wax. This was granted to the group by a



The external and internal appearance of the improved log-hive



Internal parts of the improved log-hive



Internal parts of the improved log-hive

well-wisher. The machine belongs to the group but under the custody of the group chairperson and placed at a central location where each member accesses and uses to extract honey. Currently, CAB-ESI buys the semi-refined honey twice a year from the group through an informal supply contract.

The improved log hives produce larger quantities of wax and they are heat efficient since they have thick walls. They are also cheap to make since they use the locally available materials and they can be produced by artisans who have less skills compared to modern hives. Besides, improvement of the existing log hives curtails unnecessary cutting down of trees to make new hives. The members

who adopted the technology sustained their bee colonies throughout the dry season because the queen is not disturbed during harvesting. There is also improvement of farmers' income and sells a jar (4.5 kg tin) of unrefined honey at Ksh, 1,500 up from Ksh. 800 due to improved quality hence Ksh. 700 changes in revenue. This has assisted in payment of school fees and buying of food for the family, consequently improving their lives.

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The group intends to increase the number of productive hives, enhance aggregation of honey, package and sell as a group to benefit from the economies of scale and increase bargaining power on the pricing of honey.

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Women Group Reap Big on Honey Value Addition

Kapelel women group is located in Kodich location, West Pokot County. The value chain organization (VCO) was started in 2010 and registered in the same year. The VCO has a membership of 16 (3 adult male, 6 adult female, 1 male youth and 6 female youth). The VCO initially raised their capital where members contributed between Ksh. 2000 to 5000 according to their capability. They raised Ksh. 54,000 which was invested in purchase and selling of raw honey. They used the money raised to buy 540 kg of raw honey which was sold to the buyers at a profit. The group purchases honey from members and non-members. The group continued with the business though it was experiencing post-harvest losses due to poor handling of honey. It had

no knowledge on utilization of some hive products like bees wax and propolis.

A number of their customers needed semi-refined honey yet the group did not have the necessary equipment to extract the product. The VCO, therefore, felt that honey extraction equipment was necessary. The honey store that was being used earlier did not meet the public health requirements which guarantee food safety as stipulated in the Food Drugs and Chemical Substances Act - Cap 254. Similarly, the group was using non-food grade containers contrary to the regulations.

In 2014 ASDSP trained the group on post-harvest handling of honey and utilization of other hive

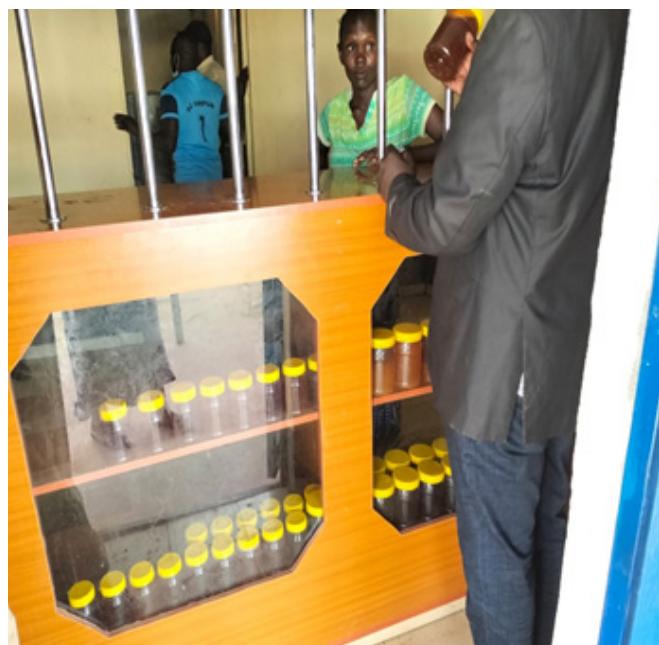
products. The group was further linked by ASDSP to a service provider Camel, bees and silk group (CABESI), which is a community-based organization for in-depth trainings on apiculture. In addition, ASDSP linked the group to Action against Hunger (ACF) organization for infrastructure support. Action Against Hunger supported the group with honey processing equipment including centrifugal honey extractor, honey press, food grade packaging, honey labels and digital weighing scales worth Ksh. 500,000. They also upgraded the VCO's honey store at Ksh. 300,000 and provided business starting capital of Ksh .800,000.

The upgraded store also serves as a processing point and the front side is the honey shop for the group. Group members have a duty roster to run the honey shop. The trainings and infrastructure support has aided the group to improve on their honey processing and attracting more customers. They have also diversified to sale of bees' wax. Acquisition of the centrifuge enabled the group to increase the amount of honey refined from one ton to three tons..

Semi-refined honey is sold to CABESI community-based organization and Kerio Valley Development Authority while wax is sold to Bee Care Limited. The VCOs sells the honey and by products twice in a year as it follows the seasonal production. The group purchases comb honey at Ksh. 150 per kg and sells at Ksh. 500 per kg after processing. The



Centrifugal honey extractor



Honey selling shop for the Group at Kodich shopping Centre

wax which forms about 25 per cent of the comb honey is melted and sold at Ksh. 400 per kg from an initial price of Ksh. 80 before the training. The group is able to make on average a profit of Ksh. 655,000 per season. If the profit is divided among members, each gets about Ksh. 40,900 per season. Hence, with the County having two seasons, each member gets on average Ksh. 81,900. The resultant profit is shared among the members and part of it is ploughed back in the business. The group also holds 20 per cent of the profit as cash reserve which is loaned out to members at an interest of 10 percent cent. The minimum loan amount is Ksh1,000 while the maximum is Ksh. 20,000. The group has created employment for six people during the peak period who are paid Ksh. 50 for cleaning at least 27 containers of 20 kg each.

At the household level, lives have improved and food and nutrition security enhanced out of the incomes generated. In addition, the women are able to pay school fees for their children hence improved school enrollment and retention. There still remains a huge potential for upscaling the operations. The group has a future plan to acquire the Kenya Bureau of Standard certification. The VCO has an intention of aggregating with other like-minded VCOs to serve larger markets. Some group members were excited to narrate their experiences and success stories, as told by Mrs. Margaret Kapachikwa below:

Margaret Kapachikwa; Empowerment through Honey Value Addition



Margaret Kapachikwa packaging honey after extracting from the combs

I started engaging in honey business in the year 2010 as an individual. I used to buy raw honey from people hawking honey and resell immediately at a marginal profit. I joined Kapelel women group in 2010 which had been registered as a women group with the aim of raising capital for trading in honey. At that time, I was handling about 50 kgs so I could easily sell the little quantity of honey easily. Although I handled little honey, the profit was attractive so I sourced for funds to increase the quantity because honey was readily available.

With increased volume, the customers

mostly demanded semi-refined honey yet I did not have the skills and knowledge in honey processing. At the same time, I did not have funds to acquire the processing equipment. Through the women group, ASDSP trained me on honey processing skills and linked our group to ACF. ACF gave our women group honey processing equipment and helped in improvement of our honey store and shop. It also boosted the group working capital.

Currently I handle more honey, approximately 500 kgs per season due to the availability of the honey processing equipment. The women group is my principal market for honey because I sell the unprocessed honey to the group which goes ahead to process and sell. Due to the ready market, the price of unprocessed honey increased from 150 to 250 shillings per kilogram which translates to more income for me. The group also gives loans and advance payments which assists me to meet some pressing needs like school fees and food. I am able to buy food that is not grown in my farm thus diversifying the diet for my children.

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18 Fredrick Mugo Reaps Big from Participatory Scenario Planning

KIRINYAGA

Climate change is a real phenomenon whose effect is global and characterized by erratic weather. In Kirinyaga county, the effects are felt seasonally through depressed or excessive rainfall. Value chain actors have continuously suffered the adversities of unpredicted weather patterns resulting in loss of incomes. To cushion communities against erratic weather patterns that affect value chain performance, ASDSP in collaboration with the Meteorological Department initiated the provision of seasonal weather advisories referred to as participatory scenario planning (PSP) to the farming community in Kirinyaga County.

Participatory scenario planning aims to increase the capacity of vulnerable households in the

county to adapt to climate variability and change, through community-based adaptation approaches. The process is community led whereby community priorities, needs, knowledge, and capacities are considered. The PSP process involves the presentation of a season's weather forecast by the County Director of Meteorological Services (CMS) to select stakeholders and agricultural experts. The forecast is then interpreted into scenario probabilities indicated as normal rainfall, above rainfall or below average and a prediction on their possible effects on agriculture is provided. From these scenarios, weather advisories are developed and disseminated in the county through public barazas, Value chain SHGs, group meetings, ra-



Banana crop under drip irrigation system



KTB hives for sale due to PSP advisories

dio/Television and online through Facebook and WhatsApp. The County Thematic Climate Change Committee opened a WhatsApp weather information group link <https://chat.whatsapp.com/IpDoP-9wFKCu8rEuydvKhuH>

Fredrick Mutuota is a banana producer in Kiari-tha village Kirinyaga Central Sub County who has benefitted from PSP. He also grows coffee, macadamia, vegetables, bananas, ornamental flowers and shrubs, arrow roots and practices apiculture production on his 2.5 acres farm. He cultivates the arrow roots on a commercial scale through the use of a solar powered pump for irrigation using water from river Rutui.

Since the inception of PSP in 2013 to date, Mr. Mutuota has actively participated in every season's climate advisories development, a process conducted by the county Climate Smart committee whose is the County Department of Meteorology. He follows keenly the seasonal recommendations, practices and innovations in the advisories. This he says has led to an increase in incomes from his farm. The farmer has taken advantage of increase of forage in his farm by establishing an apiary. The bees have a big role in pollination of his and neighbours crops that has contributed to increase in production and thus enhanced income.

Initially the farmer had few hives before embracing the PSP advisories. Participatory scenario planning provided Mr Mutuota with the foundational bee keeping skills and knowledge through the seasonal advisories. The livestock experts in the committee have helped him to improve his bee keeping skills from subsistence to commercial level. He follows

closely the instructions given on apiary management which have led to an increase in his honey production. He has moved a step further into value addition as well as construction of beehives.

The programme further linked him to The National Bee Keeping Station, Lenana where his skills were further enhanced. The training he got was the turning point to full commercialization of his bee keeping. He was trained on bee keeping husbandry skills, Value addition and hive making techniques. This has qualified him as a training of trainers in apiculture and this has made him a service provider in training other interested bee keeping farmers. He does the training at a fee depending on the scope of the training content. He trains individuals and groups on apiary either on his farm or wherever he is invited to offer the service. A full day training costs Ksh.1000 while a group of maximum 15 people pay Ksh.5000. He also offers honey harvesting services at a fee for those with fear of being stung or lacking harvesting attire.

Mutuota has a bee hive workshop and makes both Kenya Top bar hive (KTBH) and Langstroth. He sells Langstroth at a cost of Ksh.5,000 to Ksh.7000 depending on the type of wood used while the KTBH costs between Ksh.4500 to Ksh.6000. In the year 2022, NARIGP programme in Kirinyaga county engaged Mr. Mutuota to supply 400 KTBH at Ksh. 6000 to a group of farmers to promote Bee keeping value chain. This was a big boost to his enterprise.

Mr. Mutuota is grateful to ASDSP for introducing PSP in the county and encourages other farmers to follow them in order to mitigate the effects of climate change.

Kitui County is an arid and semi-arid land (ASAL), with bimodal rainfall ranging between 450 to 1,050 millimetres per annum. Drought tolerant crops such green grams are adaptable to this agro ecological zone. Due to its adaptability, the crop is grown by 62 per cent of farmers and is an important contributor to food & nutrition security and income generation. The main varieties grown are KS20, N26, Biashara and Karembo with an average yield of 200kgs per acre against a potential of 720Kg per acre. Green gram is among the 3 value chains supported by ASDSP II in Kitui County. The programme supports 126 VCOs along all the value chain nodes namely: input supply, production, trade, processing and transport. Kauongo Cooperative located in Kitui Rural Sub County, Yatta/ Kwa Vonza Ward, is one such cooperative that has benefitted from interventions by the programme and partners.

In 2012 ASDSPI mobilized 36 farmers (17 adult male, 14 adult females and 5 youth females) to register Kauongo Self-help Group with the main aim of enhancing green gram production amongst members. At that time, members produced green grams on an average of 1.4 acres per member (a total of 50 to 55 acres) with yields of 135 to 180 kg per acre. Production was mainly characterized by ox drawn ploughing cultivation and weeding and poor record keeping. The producers were price takers with selling prices ranging from Ksh. 40 to 45 per kilogram and had no defined selling site.

ASDSP interventions to the group were guided by gap analysis and included capacity building on good green gram agronomic practices and conservation agriculture for increased production and productivity. Additional support from the programme involved amalgamation with other groups to form a Community Based Organization, (CBO). The amalgamation assured more bargaining power and linkages to other projects, organizations and service

providers such as Kenya Cereal Enhancement Programme-Climate Resilient Agricultural Livelihood Window (KCEP-CRAL), Smart Logistics and financial institutions namely Equity bank. The programme also introduced community service providers to support the CBO with trainings and services on conservation agriculture, pest management and green gram threshing.

The CBO is currently a cooperative with a membership of 294 farmers (61 adult males, 142 adult females, 14 youth males and 72 youth females). The aggregation of green grams has increased from initial 70 bags per season to current 4,000 bags of green grams per season and are diversifying to other crops like sorghum, millet and beans. The prices of green grams have increased from the initial Ksh.40/Kg to current Ksh.120 per Kg due to better aggregation methods and processes of production which has ensured produce is clean and of good quality. Currently 187 farmers (34 adult males, 112 females, 5 youth males and 36 youth females) are implementing conservation agriculture (tractor drawn rippers) resulting in an increase of production from 135 Kgs per acre to 450 Kgs per acre. The area under green grams has also increased from initial 50 acres by former kauongo self- help group members to a total of 1,086 acres by the cooperative members.

The group has attracted support for construction of a warehouse, sorting, cleaning and grading machine. This has been done in a partnership model where the cooperative contributed 10 per cent of total cost. The group savings have grown to current Ksh 37.8 million and are in process of securing loan from equity bank. The future vision of the cooperative is to acquire their own tractor drawn ripper, digitization of records, branding and packaging of green grams and adoption of warehouse receipt system



Kauongo store constructed in partnership with KCEP- CRAL after ASDSP linkage



Kauongo store constructed in partnership with KCEP- CRAL after ASDSP linkage

20 The Making of Millionaire from Mango Fruit Tree Nurseries



MACBOSS Investment;-Tala Branch nursery site

Mr Sila Mboli is a model value chain actor in the mango value chain, specializing in the supply of inputs specifically mango seedlings to farmers. He owns three successful fruit nurseries, the Macboss Nurseries, in Machakos town, Tala in Matungulu Sub County and one in Taita Taveta County. Macboss fruit nursery was started in Machakos town 2009 as a banana tissue culture hardening demonstration plot organized by the then Ministry of Agriculture and Jomo Kenyatta University of Agriculture and Technology (JKUAT). Similar nurseries were established at Matungulu and Kangundo as subsidiaries of Macboss.

In 2012, Mr. Mboli diversified this business and started producing seedlings for other tropical fruits such as oranges, lemons, avocado and passion. In 2013 Macboss Nurseries was identified by ASDSP I as an input supplier and joined the Mango Value Chain Platform (MVCP). Through ASDSP I he was trained on the importance of nursery registration and nursery business regulation. He was also elected the chairman for the MVCP which is now the Machakos County Mango Value Chain Association (MCMVCA). After the training by ASDSP I, Mr. Mboli registered his nursery with the Horticultural Crop Directorate (HCD) and received certification from KEPHIS as a registered and certified fruit nursery in 2014. The following year, he changed the name of the business to MACBOSS Investment

limited and started operating as a business entity. Since he was now recognized as a model nursery operator, Mr. Mboli, opened his Tala branch nursery site as a training venue for other mango value chain Actors.

As the business grew through networking and linkages, in 2021 he was able to supply 8,000 mango seedlings to Kilifi County and 15,000 tissue culture bananas to Taita Taveta through MESPT and wonder Agriculture earning a gross profit of approximately Ksh.2.3 million. Currently through ASDSP II, Mr. Mboli spearheads trainings for nursery operators and grafters extending to others outside Machakos County. He has hosted various trainers such as KALRO, JKUAT, Department of Agriculture and Food Security, Horticulture Crops Directorate, KEPHIS and several private Service providers on his nursery site for trainings and demonstration of various Climate Smart Agriculture and Green Growth technologies.

He also serves as a service provider under ASDSP II by training mango value chain actors on nursery establishment and management. Mr. Mboli is a hands on businessman whose business turnover is estimated at Ksh. 700,000 per year. Mr. Mboli is proud of the trainings, exposure and linkages he has received from ASDSP II and other partners enabling him to develop his business for more incomes.



Grafters training; Grafting session at MACBOSS Investment (Tala Branch)

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Better Earnings Attract Farmers to Pyrethrum Production

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Pyrethrum as a cash crops grown in the highlands of Kenya has undergone various challenges since the year 1990 among them the global shift to use of synthetic pesticides. The shift resulted to low prices hence most farmers abandoned production of the crop. Nakuru County was one of the leading producers of pyrethrum realizing more than 18,000 tons of pyrethrum annually in the 1970s and 1980s. This production fell due to many challenges in the sector and by the year 2022, the overall production was less than 60 tons. The crop has however gained popularity due to changes in consumer preferences for natural products and global advocacy on sustainable natural resource management due to effects of climate change.

The crop is among the three (3) value chains supported by ASDSP II in Nakuru County. Due to various interventions by County Government, ASDSP and other development partners, the acreage under the crop has increased from 501 acres at the start of ASDSP I in 2012 to 3280 acres by year 2022. The crop is grown in 8 Sub Counties namely: Kuresoi North, Kuresoi South, Naivasha, Gilgil, Molo, Njoro, Bahati and Subukia. Interventions by ASDSP I started with mobilization of value chain

organizations and actors to develop a strategic integrated value chain action plan (SIVCAP) through a participatory approach. The team identified the key challenges to be addressed along the value chain and documented them into the SIVCAP with actions to be undertaken, timelines and required resources

Clean planting material was identified as the key limiting factor in the value chain development. Through the ASDSP II innovation funds, 80,000 Tissue culture seedlings were procured and distributed to 15 value chain organizations (VCOs) to establish tissue culture nurseries in the eight (8) pyrethrum growing sub counties. In addition to this, 27 value chain actors were issued with 50 Kgs of P4 seeds for planting. The County has aggregated a total of 55 VCOs with approximately 4000 members of whom 1800 are female and 120 youth involved in pyrethrum value chain.

One of the beneficiary VCO , Double green Pyrethrum growers group narrated their story on revival of the pyrethrum value chain in their region and the impact it has created as described below.

Double Green Pyrethrum Growers Group on Revival of the Pyrethrum

Double Green Pyrethrum Growers Group, was started in 2015 with a membership of 20 persons (6 male, 8 female and 2 youth). The group was initially involved in onions and green house tomato production. They also had a merry go round where each member contributed of KES 200/- per month. In November 2021, the group embraced pyrethrum production when members signed contracts with Kentegra company on pyrethrum production. They were supplied with pyrethrum seedlings to cover a minimum of $\frac{1}{4}$ acre land and 10 kg of planting fertilizer. This however was not adequate and in 2022, after training by ASDSP II the group was among the 55 VCOs that benefited from the innovation grants. The ASDSP II innovation grant supported the group with 5,000 pyrethrum tissue culture seedlings. The seedlings were bulked at one bulking site and after four months, the members shared the pyrethrum splits amongst themselves and each member was able to plant at least an additional $\frac{1}{4}$ an acre.

To ensure success of the intervention, ASDSP II supported a service provider to continue training the group on good agricultural practices, pyrethrum tissue culture nursery establishment and management, and business development. As a result of the intervention and implementation of the learnt good agricultural practices, each member harvests 250kg/ $\frac{1}{4}$ an acre which they aggregate and sell to Pyrethrum Processing Company of Kenya (PPCK). The group is paid according to the pyrethrin content unlike previously when they were paid a flat rate of Ksh. 230 per kg.

"We are very pleased with the results" says Mr. Ndungu the chairman of Double Green pyrethrum Group. "Our production has improved because of the tissue culture seedlings and the training we received and we are selling dried flowers at Ksh.400 per Kg instead of previous Ksh.230 making on average Ksh.100,000 from $\frac{1}{4}$ of an acre each" he adds.



Mr. Martin Ndungu, chairman of the group at his pyrethrum farm



The VCAs counting and arranging Tissue Culture pyrethrum materials for the VCO



A good pyrethrum crop by a value chain actor

Transforming Lives through Silage Making and Milk Aggregation



Tumaini Dairy group making silage using silage making and wrapping machine

Tumaini Dairy Self-Help Group (SHG) was founded in 2010 by 30 motivated young men and women who wanted to make a living by selling cow milk. Using a hired motorbike and each member owning at least one dairy cow, the group began marketing 300 litres of milk to Brookside Dairy Limited at a rate of Ksh. 25.00 per litre per day. By 2013, the membership had increased to 51 (16 male youths, 35 female youths), and the group was selling 600 litres of milk every day at a cost of Ksh. 30.00 per litre.

Today, the group has grown to 114 members, including 70 adult men, 19 adult women, and 23 youths. The group's reach extends to crucial catchment areas such as Igamurathi, Gaichau, and Weru sub-locations, and is located at Muthiru Market, just 3 km from Marima Shopping Centre in Muthambi Ward of Maara Sub-County, Tharaka Nithi County. Tumaini Dairy Self-Help Group initially had challenges such as lack of technical knowledge and poor and/or inadequate feeds for their animals which resulted in low milk production.

Agricultural Sector Development Support Programme (ASDSP) II recognized the group's potential during the mapping phase one in 2013. As a result, the group joined the Cow Milk Platform as a youth group. This presented them with countless opportunities for capacity building on dairy value chain development. In 2022, Through ASDSP II, the group purchased a silage-making and wrapping machine, and they were training on silage production. The group also put in place a 5-acre



Baled silage

silage maize demonstration plot to improve the members knowledge and capacities, on dairy production. The group was then connected to service providers for additional capacity building.

The group's membership in the Cow Milk Platform enabled successful engagement with several stakeholders along the value chain. These collaborations have resulted in enhanced output and the pursuit of beneficial partnerships. The group's membership has increased, and it now at 114 members. Daily milk sales have risen from 600 to 1300 litres per day.

The group purchased a Land Rover for milk transportation from milk proceeds. The vehicle was eventually sold, and the funds were reinvested in group projects. They have currently hired a carrier to efficiently transport their milk to the processing plant. In addition, with the help of a saving and credit cooperative loan, the group built an office, a feed store, and a structure for a milk chilling facility, complete with three-phase power.

The group was supported by ASDSP with silage making and packaging machine, which consisted of shredder and chopper and then to compact through a conveyer. The compressed bale is secured with a string and passed on to the wrapper where the bale is wrapped with a thin polythene film to keep of any material contact with oxygen to avoid rotting. The group has delved into silage production and provides silage-making services to members and other farmers in need. The

equipment has a capacity of between 40 and 80 Kgs within one minute. They have successfully generated over 100,000 Kgs of silage for sale and are continuing to expand. The revenue generated from chopping/ baling/ sales of silage between July 2022 and March 2023 was Ksh. 1,944,450.

The group has realized significant increase in milk prices, from Ksh. 30 to. 52, that have now improved their incomes thereby improving their lives as most members have no difficulty educating their children and they are food secure. They already have access to a chilling facility at Iriga market, but their long-term plan includes purchasing their own chilling tank. ASDSP II established collaborations with stakeholders such as JufraAgro-Strategies limited, Equity Bank, the Livestock Department, and the Veterinary Department. These interactions have resulted in group capacity improvement and broaden their knowledge. The number of dairy animals has increased, with each farmer now owning an average of two cows.

The group has formed a youth wing with eleven members; six men and five women, which is devoted to supporting young people to join dairy farming. Tumaini Dairy Self-Help Group has also developed a welfare subgroup, which has 21 members. The primary goal of this subgroup is to lend money to other members, and there are presently over Ksh. 4 million in circulation. It has also received a silage shredding and chopping machine through a loan from the welfare subgroup, with the intention of repaying the loan with interest. Daily milk pro-

duction per cow has risen significantly from 4 litres an impressive 12 litres.

The group has created over ten job opportunities, directly involving young people in silage production, office management and milk transportation to the chiller. Furthermore, group members are self-employed, making a living through their dairy enterprises. Members of the Tumaini dairy self-help group have installed biogas plants, which minimize the demand for fuel wood while also improving animal waste management. Also, the group's silage production and preservation practices are environmentally friendly and save time.

The Tumaini Dairy SHG has several plans, including focusing on breed improvement to increase productivity, conducting internal and external resource mobilization activities to obtain a chilling tank, which will improve milk storage and preservation. They also plan to holding regular technical training sessions to empower members and continuously improve milk output. The team hopes to reach a daily production target of at least 15 litres per cow per day.

Tumaini Dairy SHG has impacted the lives of its members with the significant support of ASDSP II. The group continues to thrive because of increasing output, expanding networks, and a dedication to sustainable practices. Their experience demonstrates the power of collective action and the transformative influence of well-designed interventions.

23 Solar Powered Irrigation of Sweet Potato Vines Brings Good Tidings to Youth Group

Solar Powered Irrigation of Sweet Potato Vines Brings Good Tidings to Youth Group

Sweet potato is one of the important food security and income earning crop for farmers in Migori County. The crop is rich in carbohydrates thus crucial source of energy. It is an excellent source of vitamins A, B complex, C and E especially the orange fleshed varieties. Other nutrition elements in sweet potato are iron, zinc, potassium, and fiber hence its importance in food nutrition. Sweet potato is among the three (3) ASDSP prioritized value chains promoted by the County. The coun-

ty developed a strategic integrated value chain action plan for development of the sweet potato value chain by the value chain organizations and actors. Among the value chain organizations supported to implement some interventions in sweet potato value chain is the Weito Decentralized Vine Multipliers (DVM) youth group.

Weito Decentralized Vine Multipliers (DVM) youth group is located in Masaba ward, Kuria West sub county. The group was started in 2018 with 10 members comprising of 3 male youth and 7 female youths and registered with Department responsi-



Solar powered kit supported through ASDSP II Innovation grants

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ble for social services in 2020. Currently, the number of beneficiaries is 25, that includes 10 male youth and 15 female youth. The main objectives of the group are bulking and selling of sweet potato vines to farmers, merry-go-round and table banking. The objective or focus of the group was informed by the scarcity of sweet potato planting materials and low yields that resulted due to recycling of diseased materials by farmers.

Weito DVM group was one of the groups identified and trained on raising clean sweet potato vines in the nurseries by ASDSP in collaboration with KALRO Njoro. The group took the challenge of raising clean sweet potato vines/seed in the nurseries and it picked it as a business idea, and they have been doing it to date. The group was linked to KALRO and the International Potato Centre (CIP) for sourcing of clean planting materials, further trainings and market linkages. Other ASDSP and NARIGP sweet potato growing groups therefore became their main beneficiaries.

To ensure all year sweet potato vines production, the International Potato Center trained the group on irrigation technologies and net tunnel construction for nurseries establishment. The farmers

faced the challenge of lack of electricity and due to low incomes they could not afford buying generators to pump water for irrigation. The group was supported by ASDSP with a complete solar powered irrigation system which comprised of 70 meter water pump, 1000 litre water tank and tank tower at a cost of Ksh. 337,350. This has resulted in improved access to water for irrigating the sweet potato vines multiplication fields. The innovation provided an opportunity for youths to increase vine productivity while better managing natural resources through use of renewable energy sources. In addition, raising the vines in net tunnels limited insect and other vectors infestation hence reduction in use of pesticides.

Before the introduction of the ASDSP and CIP innovations for vine multiplication, production was at 2MT to 3 MT per acre and after the intervention it has increased 8 to 10 MT per acre though still aiming to reach their potential of 15 MT per acre. This translates to an income of between Ksh. 300,000 to Ksh. 450,000 per acre, at a selling price of Ksh. 30 per kg. The acreage for sweet potato nurseries increased from 0.25 to one acre, that is, from 10 beds to 50 beds. Production of vines has increased

from 20 bags to 200 bags and each bags has an average of 1000 vine cuttings of 30 centimeter long that mature in two months.

The bulking site used by the group also acts as aggregation and buying centers where customers can access planting materials. A bag of planting materials is sells at Ksh 500 to 1000 from Ksh 300 previously. The increase is attributed to availability of disease-free quality vines. The cost of production for one acre of planting vines is Ksh Ksh.113,300, while the total income per acre is Ksh.360, 000, hence the profit is estimated at Ksh 246,700. Before the group was supported with the innovation, profit from the one acre per season was Ksh 700. The annual income for members has increased significantly to Ksh.28, 800. The root tu-

bers harvested is consumed by households while overgrown ones are fed to livestock.

The demand of the planting vines has been on increase. Currently, request to supply the vines is 150 bags per day against the current production of 100 bags per month. There has been request to supply the vines beyond Migori County to other areas in Homabay, Kakamega and Kisii Counties. The demand to supply vines is anticipated to increase due to the awareness on benefits of using quality planting materials and the operationalization of sweet potato processing plant in Migori County. To counter this the group in partnership with ASDSP and the County Government is sensitizing more groups to collaborate with the youth group and encouraging the members to venture into sweet potato tuber production individually.



Members of Weito DVM Youth Group tending to their potato vine harvesting to be supplied to a NARIGP Supported group

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Greening the Environment for more Incomes and Food Security

Climate change and variability remain a big challenge to the agricultural sector in Makueni County posing a threat to sustainable land management and food security. Various adaptation measures have been promoted by various stakeholders for implementation by farmers and farmers groups to address this challenge. One such group that has taken the initiative is E9 Solutions Limited, a women led group in Kibwezi Sub County engaged in commercial assorted tree seedlings production (fruit and non-fruit seedlings) for sale within the County and beyond since year 2018. The group is certified by the Horticulture Crop Directorate (HCD) and Kenya Plant Health Inspectorate Service (KEPHIS). Kenya Forestry Research Institute (KEFRI)

supports the group with tree seeds and market linkages for tree seedlings. The group has employed three tree nursery attendants at Ksh. 8,000 per month and hires about ten (10) casuals during the peak periods and an accountant on need basis at a cost of Ksh. 350 per day. They have currently engaged one student on internship. The group produces high quality agro-forestry tree seedlings, flowers and fruit trees specifically mango tree seedlings and a variety of citrus tree seedlings. Due to the erratic rainfall within the region, the group was incurring high water costs to the tune of Ksh. 40,000 per month which affected the productivity and profitability of their enterprise.

The group was supported by ASDSP II in year 2021 with modern irrigation kits comprising of storage tanks, dam liners, shade nets, water pump and drip irrigation kits for their tree nursery at a cost of Ksh. 1,637,095. As a result, the group has been able to increase seedling production from 20,000 tree seedlings in 2019 to 100,000 seedlings in the year 2022 out of which they are able to sell about 87,000 seedlings. The support has led to reduction on cost of production for purchase of water and labor cost for watering thus improving efficiency. For example from sale of 10,000 mango seedlings they made a profit of Ksh one million in year 2022.



Rain water harvesting structure supported by ASDSP II



Group tree seedlings inside a shade net

Rain water harvesting structure supported by ASDSP II Group tree seedlings inside a shade net

The group has engaged the youth to market the seedlings online and payment is on commission basis. They have also been linked to other institutional websites such as Equity Bank, KEFRI and County Government of Makueni for ease of mar-

keting. The group acts as a model farm that trains farmers from Makueni, Kajiado and Kitui Counties thereby enhancing knowledge and technology transfer. Through their intervention, forest cover for the County is expected to improve from the current levels of 8.7 per cent as per the Kenya National Statistical Abstract of 2022 to a target of 10 per cent. Availability of quality fruit tree seedlings from this group has resulted into an increase in number and yields of mangoes and citrus fruits within the county. Farmers buying the seedlings are trained on soil and water harvesting technologies as they establish their orchards and this has greatly enhanced sustainable land management as well as environmental conservation for climate resilience. Since 2021, about 200 individual farmers have been trained on water harvesting, nursery establishment and management.



Group inspecting the nursery after training



Loading of tree seedlings for a customer

TATABA cooperative empowering farmers and expanding markets



TATABA Cooperative Members at the Ripening Chamber and banana trading center

The Taita Taveta banana producers' cooperative society (TATABA) was founded in 2018. The society was formerly registered as TUWETA cooperative company that dealt with the marketing of horticultural crops. TUWETA became dormant due to low produce volumes and decline in membership. This led to re-registration and change of name to TATABA and their focus changed to banana production and marketing. A new board of directors was elected to lead the cooperative with the aim of revitalizing the society. The board began collaborating with the Taita Taveta County Government, the Agriculture Sector Development Support Programme II (ASDSP II), and other sector partners. Together, they launched a special initiative to improve the management practices in bananas, support markets, and create job opportunities for the local communities aimed at improving the lives of banana growers in Taita Taveta County. Both existing banana producer organizations and individuals in the Taita Taveta area interested in the banana value chain are eligible to join the cooperative.

There are approximately 5,000 banana producers in Taita Taveta County and TATABA cooperative acts as an intermediary in marketing bananas from its 466 registered members through aggregation. The aggregation assures the farmers of a ready market and has motivated more farmers to plant more bananas. On average an individual farmer is able to deliver a total of 465 tons per month valued at Ksh. 1500 per day which is approximately Ksh 45,000 per month.

To further support the farmers, the Cooperative set up banana ripening chambers in Voi town. These chambers are crucial in improving the quality and value of freshly harvested bananas. They not only prevent post-harvest losses but have become a convenient source of ripe bananas to nearby retailers and consumers. Previously, retailers had to travel to Taveta to find ripened bananas, but the establishment of these chambers in Voi has greatly benefited the local market.

The presence of ripe bananas in Voi has greatly enhanced market accessibility for both farmers and consumers. There is no longer a need for retailers and other buyers to travel long distances to obtain ripe bananas. This increased accessibility of ripe banana has expanded the potential of the local market, both for farmers and consumers. By strengthening the local market, the cooperative has contributed to a more sustainable and prosperous agricultural environment.

The collaboration between TATABA Cooperative and ASDSP II has not only enhanced good agricultural practices in banana value chain but has also brought about value addition in the county as well as enhancing market linkages. The ripening chambers function as hubs for aggregation and value addition, thereby enabling the production of high quality ripened bananas. This value addition empowers farmers to negotiate for improved prices for their crops and boosts their income

26 Enhancing Arid and Semi-Arid Lands Resilience for Income and Food

An impressive feat achieved by the cooperative is the distribution of more than 10,000 superior banana seedlings among Taita Taveta's farmers. TATABA utilizes rapid multiplication technology and tissue culture to produce clean planting materials, which are offered to members at a low cost. The seedlings include the highly regarded Cavendish, Grand Nain, and cooking varieties commonly referred to as *matoke*. The initiative has not only empowered the farmers, but also strengthened their capacity to grow high yielding and quality bananas. By year 2023, the cooperative was managing approximately 6200 kilograms of bananas, which is equivalent to the total capacity of 380 crates daily. To manage its operations, the cooperative has employed two permanent staff mem-

bers. In addition, six young individuals are hired on a temporary or as-needed basis for tasks such as unloading and loading.

The cooperative's initiatives have not only positively impacted farmers in Taita Taveta County but have also had a ripple effect on neighboring counties. Through the promotion of aggregation and ripening chambers, improved market access, the cooperative has motivated farmers from surrounding areas to embrace better farming techniques. Consequently, this has led to a boost in agricultural production, creation of employment opportunities, improved living standards and overall economic growth in the region.

Garissa is one of the Counties in (ASAL) regions of Kenya. Camels are the primary milk producers in the ASAL regions of Kenya, particularly during the dry season. Camel milk has great potential to enhance food and nutrition security in terms of its nutritive contents and incomes generated. Camels are resilient to drought hence when ideal for the ASALs. Their milk is also well tolerated by individuals with lactose intolerance. Strengthening entrepreneurship and market access are key ingredients for pulling camel milk production.

Naim camel milk group realized this potential and organized themselves in the year 2014 as the main camel milk vendors whereby they traded with volumes of 50 litres per day. The group started with 12 members and at present they are 25 Members (9M, 9F, 7Y). When the group members realized that camel milk business could be lucrative, they contributed Ksh 30,000 to facilitate milk collection from farmers.

The group has collaborated with African development solutions (ADESO) and ASDSP II in areas of capacity building, innovation uptakes and participation in exhibitions and exchange tours to other counties namely; Isiolo, Laikipia and Marsabit. In the year 2022, ASDSP II supported the group

through innovation grants fund totaling to Ksh 570,000. The funds were utilized to procure milk handling equipment namely: Pasteurizer (50L), Electric deep freezer, motorbike mounted with canvas gunny bags, diesel back generator and 4 Stainless steel lockable (20 litres each) milk cans.

The group has signed contracts with the nearby hotels, schools, government and private institutions as well as individual consumers, worth more than 400 Litres per day. Besides the group also sell milk to other consumers and hence are able to trade at between 500- 550 litres per day. This has led to an increase in incomes generated for the year amounting to Ksh. 2.8 million due to enhanced transportation, improved hygiene, back-up generator and storage hence no wastage. The group has employed five workers mainly youth to collect and deliver milk using motor bikes mounted with canvas gunny bags.

Through interventions by ASDSP and other stakeholders' there has been an increase in camel milk production and consumption. By implementing good agricultural practices for camel value chain, farmers have been able to increase daily milk production from 4 litres to 8-10 litres per day per camel. The area communities have come into terms of

the multi benefits of camel milk and has given it a priority in their diets too. These multi benefits include minerals, vitamins, proteins, saturated fat and carbohydrates as well as reduced resistance to insulin.

"This endeavor has been a life-changing experience for the group" says the group chairman." He goes on to say that goodwill, dedication, hard work, and patience, as well as networking and having a business strategy, are the keys to their success.



Naim camel milk parlour/ shop



Group chairman inside the milk parlour

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27 Gainful Maize Farming is Real in Kenya

NANDI

Mr. Zaphania Meresei a maize farmer in Ndalat Mosop sub-county in Nandi County. He has successfully produced maize from his 22-acre farm through adoption of good agricultural practices. Mr. Meresei farm as it's called, is a great example of a maize farming success story in the county. Successful maize farming in this case means abandoning traditional methods of thinking around farming and allowing experts who understand the science of farming to handle your agricultural needs. Mr. Meresei farm went through a very difficult time making losses and ASDSP Nandi team advised him to follow professional advice to help navigate his challenges.

"ASDSP showed me what I was doing wrong and they helped me correct it," Mr. Meresei says. He continues to narrate his journey in maize farming: Some of the challenges I faced were low plant population, weed pressure, pests, fungal disease, wrong timing of farm activities, and poor crop

nutrition. With all these challenges, the farm only managed a harvest of 6 bags per acre in 2016. A year later, that is 2017, the story was different and he recorded a tremendous increase in the harvest after implementation of good agricultural practices as advised by the agricultural officers supported by ASDSP.

The first step to profitable maize farming as advised by ASDSP was to conduct a soil test and analysis. The analysis revealed what the soil lacked and inputs needed to correct and improve the soil. The soil test also gave recommendations on what fertilizers to use. This tackled the problem of poor crop nutrition and the crops improved by becoming green, big and healthy he excitedly narrates.

The challenge of low plant population was solved by ensuring that the farm machinery (planter) was calibrated correctly. Poor calibration leads to yield losses as a result of wasteful inputs through

missed seed and fertilizer application or dispensing for example fertilizer without the seeds hence accelerating growth of weeds. Weeds which were a major problem on the farm were contained by using appropriate control methods such as use of herbicide and manual removal. He learnt through experience that weeds lead to a decrease in yields because they compete with the crop for much needed nutrients. They also decrease the soil's health by depleting minerals from it and acts as host for pests. The main pest and disease affecting his farm was fall armyworm and fungal disease (rust) which were contained by spraying the appropriate pesticides and fungicides. For a more profitable maize farming, ASDSP advised Mr. Meresei not just on the appropriate pesticide and fungicide but also on the right time for spraying to minimize wastages.

During the trainings, the team from ASDSP created a business plan and calendar of activities for the farm advising him on when to conduct various farming activities such as spraying as mentioned above, when to plant, when to plough, when to apply fertilizer etc. The calendar of activities is another seal for profitable maize farming. It ensures farm resources are utilized well, reduction in wastage and unnecessary expenses and increases yields. Mr Meresei gave an example of how a farmer can increase their costs because of not having a proper calendar of activities especially when managing fall army worm control.

Based on expertise advice, fall armyworm control should be conducted early morning or late evening when their larvae comes out to feed otherwise sprays done any other time would be wasted hence more costs and damages. His expertise in the control of fall army worms which has been a menace in the county has attracted more farmers to learn from him. He is also mentoring 10 young farmers from different villages who in turn mentors other farmers. This mentorship strategy has led to reduction of fall army worms infestation and yield losses from previous 15% to less than 2% by last season of 2022. The farmer has been able to reduce his cost of production by 50% and the savings are used to enhance other farming operation. He gave example of how labor costs have reduced from Ksh 66,000 to 33,000 as a result of mechanizing the farm operations

Implementation of advice given during the trainings by ASDSP led the farm to harvest 30 bags per acre from an initial 6 bags per acre that the farm was realizing in year 2016. This increase translates to over 500% increase in yields annually. From his farm, the farmer gets approximately 550 (90kg) bags earning an income of Ksh 2,750,000 against Ksh 850,000.00 as cost of production inclusive of labor cost for 34 workers (4 working full time namely drivers, security and farm managers and 30 contracted on need basis). The income has enabled the farmer acquire commercial plot in Eldoret town where he plans to establish a mini maize mill to process his maize before selling to the consumers in town, this would further aid him to reap more benefits along the maize value chain. As Mr. Meresei confirms, "embracing modern methods of farming through expert advice leads to reaping maximum benefits and profits".



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ASDSP Nandi team: Field Visit to Mr. Meresei Maize Farm

28 Adoption of Technology Transforms Lives of Women



Member displaying and inspecting incubators owned by Lelkoros women group

Indigenous chicken is one of the prioritized value chains in Nandi County. Lelkoros women group is a poultry keeping group in Mosop sub-county Nandi County. It was started in the year 2011 as a merry go round with 15 members and later in 2013 it was registered by the Department of Social services. Each member of the group kept 50-100 birds. The individual members in the group keep poultry to a tune each. When Lelkoros ventured into chick production, they were not sure if there was a ready market. But they took the plunge anyway and the decision has paid off. The demand for chicks made the group to buy two incubators each having a capacity of 528, hatching up to 85 per cent in a cycle and they sell at ksh.100 per day-old chick. The group gets approximately Ksh. one million in a year which they used to build an improved chicken housing for each member. The purpose of constructing the poultry house was to reduce post production losses for chicks which was as high as 50 per cent. Likewise, the profits from the chick business were used by each member to improve their residential houses.

The County has unmet demand of 2,062,970 indigenous chicken annually. In 2013, ASDSP 1 identified the VCO among the 60 VCOs in indigenous chicken value chain. The group is an umbrella of several groups which have been trained by ASDSP II on several stages of chicken production. The

group has benefited on capacity building on issues on poultry especially chick husbandry. Moreover, the group was supported by ASDSP II through enhancing trainings on innovations for brooding management including brooding boxes and also conducted cross learning tours for some members. To ensure consistent and efficient supply of chicks, ASDSP II provided funds for purchase of a high-capacity incubators and hatcher which is a technology that increases supply of chicks to farmers in the county and beyond. The technology led to increase in profitability and productivity of chicken and its products, at the same time reduced mortality rate. This will increase the number of chicks and enhance productivity at production stage.

The groups have around 300 members who will buy the chicks from Lelkoros and rear to 3-4 months old ready for slaughtering facility put up by the County Government of Nandito benefit poultry value chain actors. The group got their first batch of improved '*kienyeji*' fertilized egg from KALRO Naivasha. Due long distance to KALRO Naivasha, they are now getting Saso breed from KALRO Kakamega and some from Kaimosi Agricultural Training Centre. To meet the of high demand of chicks, the group has been getting their finances to top up their enterprise also from Uwezo fund and Women Enterprise Fund though some individuals get from Kenya women finance trust. The

loans from women enterprise fund were taken in phases of 100,000ksh, 150,000ksh, 350,000ksh, 500,000ksh and ksh. 750,000 these amounts are used by the VCO to develop the value chain and also diversify to other enterprises like dairy production. The group has also signed a collaboration framework with Nandi County stakeholders on the development of the value chain amongst them are Keriogreen Fresh Products limited, Equity Bank Kenya and Ultravetis East Africa Limited among others. The group has been working closely with other private service providers like Kuku chick, Ultravetis East Africa Limited, Uzima chicks on intervention on chick management especially disease routine management.

The operationalization of this incubators has created employment in the community especially for women and youth because they are the ones managing the machines and egg handling. When fully operational, it is anticipated that income from all the incubators will be approximately Ksh. 3.5 million in one year. The group has plans of having a poultry hub and buying a lorry for transports to deliver their products to various markets within and outside the county.

Mrs Salome Koech the chairperson of the group narrates its challenges and now the successes and says. *'I appreciate the kind of commitment the members have despite the challenge they initially experienced on chick mortalities'*



Rearing of improved Kienyeji chicken is a member's farm





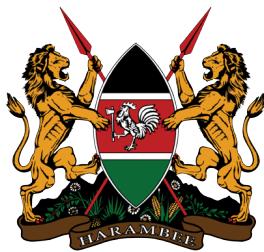
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