

THE 2ND NATIONAL FODDER COMMERCIALIZATION CONFERENCE PROGRAMME

10th -11th December 2019
Kusyombungu, Wote in Makueni County

Theme:

“Developing sustainable fodder value chain: Implications for the Big4 Agenda”



Part I

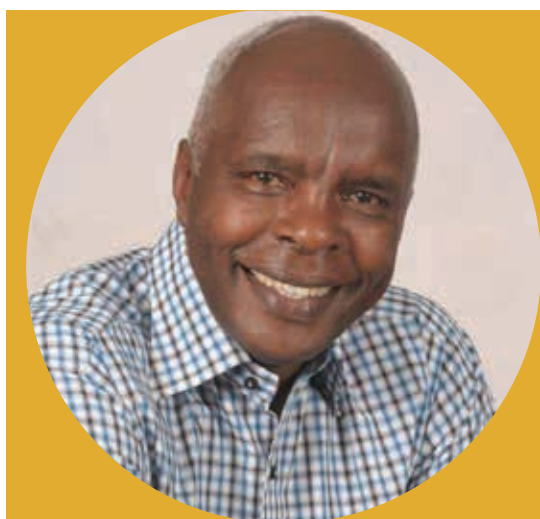


REPUBLIC OF KENYA



COUNTY GOVERNMENT
OF MAKUENI

WELCOME REMARKS BY HIS EXCELLENCY KIVUTHA KIBWANA THE GOVERNOR MAKUENI COUNTY on the occasion of the 2nd National Fodder Conference held on 10th -11th December 2019 at Kusyombunguo Hotel, Wote



**Prof. Kivutha
Kibwana**
Governor of Makueni
County

Greetings.

Welcome to Makueni County the host of the 2nd National fodder conference. We at Makueni County, an ASAL county feel privileged and honoured to host such an event.

Makueni is a county of 987,653 people (KNBS 2019) and an area of 8,008.9 km².

We have six sub-counties divided into 30 wards. The majority of our population derive their livelihood from agriculture, including crop and livestock production. Being semi-arid, Makueni County has for decades supported the conventional beef, sheep and goats production systems. In these systems, the herd and flock numbers fluctuate depending on rainfall patterns that dictate availability of natural feed resources. Subdivision of land has resulted in diminishing rangeland feed resources. This is against a background of increasing number of households with each new family keeping beef animals, sheep and goats. This puts pressure on pasture and browse resulting in overgrazing and resource degradation. Coupled with negative effects of climate change, the threat to livestock has been increasing.

Nonetheless the rising human population has exerted an ever increasing demand for livestock products. Farmers have responded by expanding investment to non-traditional value chains such as dairy production. Consequently, demand for quality pasture and fodder has increased exponentially.

It is against this background that the Government of Makueni identified dairy value chain as among the 4 major agricultural value chains to promote. Subsequently, the County and partner development agencies initiated interventions to address the feed supply gap. The interventions include:

- Capacity building of producers on pasture and fodder resource management skills
- Enhanced/Dissemination of fodder and pasture planting materials
- Mechanization of pasture production and harvesting
- Support to hay business networks
- Coordination of stakeholder efforts in the pasture and fodder value chain.
- Pursuing policy development on land use and spatial planning.

The County has so far invested Ksh, 130 million in the dairy value chain focusing on breed improvement, pasture and fodder development, livestock disease control, and milk aggregation and value addition. These interventions contribute towards attainment of the Makueni Vision 2025, Strategic Intervention NO. 8 on Soil and 3 /HE the Governor's talking notes on the occasion of the World Food Day 2019 water Conservation, Range Rehabilitation and Pasture Development. The vision undertakes, among other things, to support range rehabilitation and pasture development and conservation to promote livestock production activities including dairy farming, ranching and fattening. A total of 50,000 hectares are targeted during the 10 year period. This rhymes well with the national government's agenda on Food Security and Nutrition. The interventions also feed into theme of the 2nd Fodder Conference: "Developing sustainable fodder value chain: implications for the big 4 agenda". A functional pasture and fodder value chain would result in sustained production of livestock productions across the seasons.

Other agricultural value chains prioritized by the county include fruits value chain where we have invested in excess of Ksh. 600 million to establish a fruit processing factory. The grain value chain was also prioritized. Soon a grain factory costing Ksh. 186 million will be operational. The county has also focused on food

security initiatives which will enhance both crop and livestock production. The support includes skills development through extension services, provision of subsidized agricultural machinery services for farm ponds construction, farm preparations and hay baling among others; and promotion of irrigated agriculture.

Other prioritized value chains include indigenous poultry, sheep and goats' production to enhance household incomes.

Welcome to the 2nd National Fodder Conference.

GOD BLESS YOU.





REPUBLIC OF KENYA

MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES

MESSAGE FROM CHAIR NATIONAL FODDER CONFERENCE SECRETARIAT



Mr Albin Sang

Chair, National Fodder Conference Secretariat

Availability of sufficient and quality feeds as well as access and affordability by livestock producers are some of the key determinants of sustainable livestock production in Kenya. Drought which is usually associated with water and feed scarcity is a frequent phenomenon in Kenya. Under the circumstances, lives and livelihoods of livestock producing communities suffer most. The observed increasing frequency of droughts is mainly attributed to climate change and variability. Whenever drought happens, the Government of Kenya as well as local and international development partners are always called upon for support with a view to protecting the lives and livelihoods of the affected communities.

However, for most of the times the exact animal feed requirements (fodder supply) in tons per year distributed by region, county and by specific livestock categories have not been determined with certainty. The current status is attributed majorly to our weak livestock policy environment. Consequently, the programming of drought related livestock feed repositioning for effective and efficient responses options becomes increasingly important.

The Ministry of Agriculture, Livestock and Fisheries (State Department for Livestock) in collaboration with Livestock Production Value Chain Development Partners and the National Fodder Conference Secretariat organized the first ever National Fodder Conference in Kenya on 14th and 15th December 2017 at Sarova Woodlands Hotel in Nakuru County. During the conference, the delegates resolved to drive the fodder development value chain within the framework of the following 7 pillars thus;

- i. Data and information, reporting and communication
- ii. Inputs supply and service
- iii. Fodder and fodder seed farming
- iv. Post-harvest handling, quality and fodder safety
- v. Emerging and niche fodder markets
- vi. Research, science, technology and innovations
- vii. Policy, strategy, standards and regulatory and institutions frameworks

In an effort to drive sustainable fodder value chain development and in line with the national big four agenda on food and nutrition security for our country, it has become necessary to hold the 2nd Biannual National Fodder Agribusiness Conference. The State Department for Livestock in collaboration with Livestock Development Partners and the National Fodder Conference Secretariat has organized for the 2nd National Fodder Agribusiness Conference at Kusyombunguo Hotel, Wote in Makueni County on 27th and 28th November, 2019. In this second conference, discussions will mainly focus on the theme: "Developing sustainable fodder value chain: Implications for the Big 4 agenda" as a strategic roadmap for improved food, feed and nutrition security among livestock producers. Specifically, participants will take stock of critical milestone achievements at organization level following the commitments entered during the first conference. On my own behalf and on behalf of the NFC Secretariat, I wish to welcome all you participants to the 2nd National Fodder Agribusiness Conference.



FOREWARD

REMARKS BY MR. MWANGI KIUNJURI, EGH, MINISTER FOR AGRICULTURE, LIVESTOCK AND FISHERIES.



Mwangi Kiunjuri
Cabinet Secretary

*Ministry of Agriculture, Livestock &
Fisheries*

The agriculture sector contributes 26% to the Gross Domestic Product. It is therefore a very important sector to the economy. Under vision 2030, it is envisaged that the sector will grow at 10% annually. At regional level the African continent has developed the Comprehensive Africa Agriculture Development Programme which looks at the improvement of productivity in agricultural output. Productivity improvement in agriculture rests on the removal of a number of structural constraints affecting the sector.

A key constraint is climatic uncertainty, which raises the risk factor facing intensive agriculture based on the significant inflow of private investment.

Consequently, governments must support the provision of irrigation equipment and develop arable lands where private agents are unwilling to do so. The improvement of other rural infrastructure (roads, rural electrification etc.) is also essential.

The ministry is developing 1,000,000,000 acres for irrigation and providing necessary equipment for the same. Thus, offering opportunities for re-engineering agricultural sector transformation objectives. The institutional environment for agriculture also significantly affects the sectors productivity and performance. Institutional support in the form of research centers and institutes, the provision of extension and support services and agricultural trade fairs will further boost the production of surpluses.

The regulatory framework for agriculture must also be taken into account, including the encouragement of local community leadership in rural areas and the involvement of these communities in policy and the provision of services. The ministry has undertaken regulatory framework reforms with the development of Kenya Agriculture and Livestock Research Organization, and consolidation of the Agriculture Laws in the Agriculture Food and Fisheries Authority.

Too little attention has been paid by bilateral donors and multilateral institutions to the agriculture sector and rural development, where more than 70 per cent of the poor people in Africa reside.

For example, in the World Bank lending portfolio, credits to agriculture amounted to 39 per cent in 1978, but dropped to 12 per cent in 1996 and even further to 7 per cent in 2000. There are a number of World Bank funded projects under the Agriculture Sector which include; Eastern Africa Agricultural Productivity Project and Kenya Agriculture Productivity and Agribusiness Project.

The NEPAD initiative saw the need to develop Science and Technology Platforms with the following objectives:

- To promote cross- border co-operation and connectivity by utilizing knowledge currently available in existing centers of excellence on the continent;
- To develop and adapt information collection and analysis capacity to support productive activities as well as for exports;
- To generate a critical mass of technological expertise in targeted areas that offer high growth potential, especially biotechnology and natural sciences;
- To assimilate and adapt existing technologies to diversify manufacturing production.

African countries are vulnerable because of their dependence on primary production and resource-based sectors, and their narrow export bases. There is an urgent need to diversify production and the logical starting point is to harness Africa's natural resource base. Value addition of agro-products must be increased and a broader capital goods sectors developed through a strategy of economic diversification based on inter-sectoral linkages. Private enterprise must be supported, both microenterprises in the informal sector and small and medium enterprises in the manufacturing sector, which are principal engines of growth and development.





REPUBLIC OF KENYA

REMARKS BY MR HARRY KIMTAI, CBS, PRINCIPAL SECRETARY



Harry Kimtai
Permanent Secretary,

*Ministry of Agriculture Livestock &
Fisheries*

The livestock sector contributes 10% to the gross domestic product providing livelihood to about 1 million pastoralists and 1 million small holder farmers. This sector contributes to Comprehensive Africa Agriculture Development Programme Pillar 3 which aims to increase food supply and reduce hunger across the region by raising smallholder productivity and improving responses to food emergencies. To raise smallholder productivity, there is need to develop the capacity of extension workers who provide information to these farmers. Reforms have been undertaken to recognize professional bodies' role in capacity building.

The government appreciates the importance of livestock contribution in the growth of our economy and we have done everything possible to provide the relevant environment for the sector to realize its optimal potential. The dairy farmers in the country are now not only getting good prices for their milk but are also getting paid in time.

Our livestock farmers especially those on marginal areas are now enjoying access to market for their livestock and we hope that access to market and prices will continue to improve.

The ministry is working round the clock to promote sustainable livestock production which contributes effectively to our national economic growth. We envision to be world class in efficiency and productivity especially in dairy and meat sub-sectors. In marketing, focus is more on promotion of value addition near the production points in the rural areas.

The state department of livestock has an emergency livestock restocking fund which helps the pastoralists when severe drought shocks affect their areas. The adoption of the Framework for African Agricultural Productivity, prepared under the leadership of the Forum for Agricultural Research in Africa, has allowed a broad group of development partners to start scaling up support to science and technology programmes at the regional and national levels.

This support includes funding to the sub-regional research organisations such as the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), as well as national programmes in Ghana, Mali, Senegal and Kenya. The East African Agricultural Productivity Project is being implemented where Kenya generates research information for the dairy sector and it is disseminated to the countries of Tanzania, Uganda and Ethiopia. To support pastoral systems in Kenya, the department is currently undertaking two projects on ending drought emergencies under World Bank funding namely; Regional Pastoral Livelihood Resilience Project (RPLRP) and Kenya Livestock Insurance Project (KLIP). These are funding market infrastructure, Natural Resources Development, Livelihood Support, Drought Risk Management and Livestock Insurance.



MESSAGE FROM FAO REPRESENTATIVE IN KENYA



Charles Bebay
FAO Representative
Kenya

Livestock sub Sector plays an important role in the national economy of Kenya. The sub sector contributes about 42 percent (42%) to the agricultural GDP and 12 percent (12%) to the national GDP. Livestock production is also a crucial source of food, employment, and income for much of the rural population, as well as generating investment from the private sector and other actors. Governments across the region recognize the vital role the subsector can contribute towards eradicating hunger, poverty and improving people's welfare. Optimum exploitation of this potential is constrained by a wide range of challenges. For example, sustainable access to and use of quality livestock feed remains one of the major challenges that requires urgent attention.

Climatic variability is a major constraint to seasonality-based access to livestock feeds and water. Production systems that mainly depend on migration to access forage and water are highly vulnerable to prolonged and more frequent climate extreme events.

Pastoral destitution in Kenya and the region is largely driven by protracted feed and water scarcity. While productivity under semi-intensive or intensive systems of production is largely affected by constrained access to quality supplementary feeds and fluctuating supplies of dry matter.

The Intergovernmental Authority on Development (IGAD) and its member states have thus called for greater efforts to find sustainable solutions to address animal feed gaps in the region. The Animal Feed Action Plan was developed as a means to collectively address some of the constraints in accessing and using animal feed. The action plan provides a guided approach to pave the way for the sustainable production of quality livestock and products, while improving competitiveness and profitability and ensuring appropriate feed resource management across East Africa.

In Kenya, FAO is partnering with the State Department of Livestock and 47 County Governments to establish and strengthen animal feed data, information, reporting and communication systems. I am glad to report that in April 2019, we successfully completed a livestock feed inventory and feed balance assessment for 23 Counties that fall within the Arid or Semi-Arid Lands of Kenya (ASAL's). We are currently supporting a similar exercise covering 24 Counties that fall in the medium and high rainfall areas of Kenya. We are looking forward to the successful completion of this exercise. We expect the findings of the national assessment will inform planning and contribute to the realization of the IGAD supported Animal Feed Action Plan. This year's National fodder theme **"Developing sustainable fodder value chain: Implications for the Big 4 agenda"** resonates well with our immediate plans. Most importantly our able partnership with various key stakeholders will provide traction to the delivery of the pillar on "data and information, reporting and communication on fodder". This conference is coming up at an opportune moment and we are looking forward to a great participation.

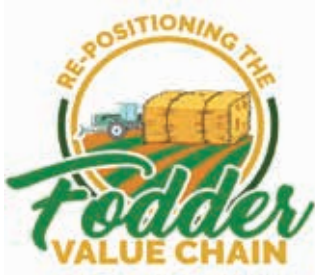
Let me take this opportunity to wish you all the best during the conference.

Charles Bebay
FAO Representative in Kenya ad interim



Part 2

About the NFC



REPUBLIC OF KENYA

NATIONAL FODDER COMMERCIALIZATION CONFERENCE

I. Introduction

The livestock sub-sector in Kenya contributes about 10 percent to the GDP and employs over 50 percent of the agricultural labour force. However, poor animal nutrition remains a key constraint to competitive and sustainable animal production.

Consequently, the country suffers deficits in dairy and beef products despite having one of the highest cattle population in Africa estimated at 17.5 million. The deficit is projected to grow due to increasing demand for animal products in the domestic and international market driven by increasing population and incomes among others unless targeted interventions are implemented to improve productivity. Proper feeding in quantity and quality can increase livestock productivity by about 40 percent.

A study on fodder value chain by USAID 2017 established that Kenya faces major forage deficit estimated at 70 per cent of the total annual fodder requirements of about 5.5 billion bales. The deficit is attributable to inadequate fodder production, conservation, overgrazing, poor land management practices and climate change effects among others. The study recommended interventions in rehabilitation of grazing lands and commercial fodder production since gross margin analysis shows fodder farming is profitable. However, production, processing, marketing and private sector investment, institutional and regulatory framework is underdeveloped,

exposing farmers to unscrupulous market actors. To share the findings of the study, USAID KAVES in collaboration with the State Department of Livestock and other stakeholders held the 1st National Fodder Conference in Nakuru in 2017. Attended by 400 delegates drawn from the 47 counties, the conference brought together value chain actors, policy makers at national and county level, researchers, development partners and private sector among others in a common platform. The conference themed **“Re-Positioning the Fodder Value Chain for sustainable livestock production in Kenya”** focused on Key components of the fodder value chain including policy and regulatory framework, production, input and support services, marketing and investment opportunities. The two-day conference identified the following seven key pillars of fodder value chain and recommended action;

1. Data and information reporting and communication
2. Strengthening Input supply and services
3. Increased fodder and fodder seed farming
4. Strengthening market linkages in the fodder value chain
5. Post-harvest handling, quality and fodder safety
6. Research, science, technology and innovation
7. Policy, strategy, standards, regulatory frameworks and institutions

To assess progress on the seven pillars, the conference recommended biannual national forums.

In line with this recommendation, the 2nd National Fodder Conference is therefore scheduled for **10th -11th Dec 2019, at Wote, Makueni County**. The purpose is to take stock of the achievements made by various actors and stakeholders in addressing constraints in the seven key pillars.

Support to the fodder value chain will contribute to global, regional and country agricultural commitments including the Comprehensive Africa Agriculture Development Programme (CAADIP) which focuses on improvement of productivity in agricultural output and the Sustainable Development Goals, that is, Goal 1 - Ending poverty in all its forms and Goal 2 - Ending hunger to achieve food security and improve nutrition and promote sustainable agriculture. At the National level, fodder commercialization will contribute to two of the four major Presidential pillars including; 1) Food and Nutrition Security; 2) Creation of Jobs through Agro- processing and Industrialization.



Overall Objective

The overall goal is to bridge the national fodder deficit for the development of a sustainable and competitive livestock sector and hence safeguard livelihoods, reduce poverty, and improve food security and nutrition.

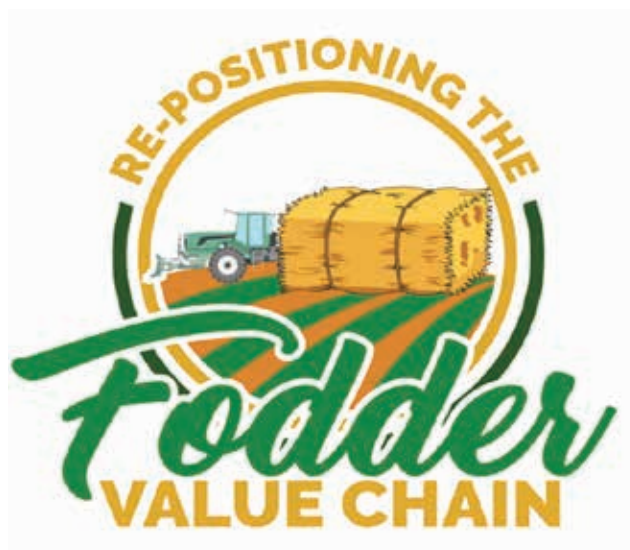
Specific Workshop Objectives

Specifically, the workshop intended to achieve the following;

- Assess progress made by various organizations in addressing the gaps identified during the first fodder conference from each of the seven key pillars.
- Share current data on feed balance situation
- Review adequacy of existing policy and regulatory framework
- Develop regional and county-based strategies in the development of the fodder value chain.
- Facilitate market linkages between fodder surplus and fodder deficit areas
- Identify investment opportunities available in the fodder value chain for public and private sector
- Create awareness on the newly developed fodder standards
- Fast track commercialization of improved fodder varieties

Expected Outputs

- Awareness of the investment opportunities in the fodder value chain will be increased
- Increased awareness on the requirements of the hay standards.
- Harmonized regional strategies for fodder production and commercialization developed.
- Identification of bottlenecks that still affect the fodder value chain
- Strategic interventions by public and private sector actors will be identified
- Collaborations among fodder value chain actors will be stimulated.
- Research on the fodder crops to diversify varieties will be enhanced.
- Policy review and formulation towards commercial fodder production will be supported



Part 3

Progress Reports from Partner Organizations

DEVELOPMENT OF FODDER HAY (Grass and Legume) STANDARDS



**Julius
Kiptarus**

**Director of Livestock Production
Ministry of Livestock, Fisheries and
Irrigation**

Livestock sector contributes to the achievement of national policy objectives set out in Vision 2030 and the National Livestock Policy. This sector contributes to the Comprehensive Africa Agriculture Development Programme Pillar 3 which aims to increase food supply and reduce hunger across the region by raising smallholder productivity and improving responses to food emergencies. Key among the goals is to contribute to incomes and food security, and sustained economic growth of 10% per year.

Availability of sufficient and quality feeds as well as their affordability by livestock producers are some of the key determinants to sustainable livestock productivity in Kenya. Feeding alone accounts for between 60 to 80% of the total production costs for any livestock production enterprise.

Numerous studies have shown that most livestock enterprises are operated under poor animal husbandry and management practices resulting in malnourished animals producing below the breed potential due to over reliance on seasonal rain-fed poor quality forage production. Field experiences further show that proper feeding in quantity and quality can increase livestock productivity by about 40 percent and often leads to improved health and fertility.

Kenya has continued to experience large feed deficits due to the annual requirements for the national livestock population estimated at 17.47 million and still growing. The annual pasture and fodder requirements is estimated at 83 Million MT of fresh matter (equivalent to 5.5 billion bales of hay weighing 15 kg each). The current production is estimated at 25 Million MT representing a 70 percent deficit (USAID-Kaves, 2016). Though over 70 percent of feed for domestic ruminants is supplied by forage materials, institutional,

policy and regulatory framework governing fodder production, processing and marketing including private sector support is still underdeveloped. Market analysis allude to the existence of significant market opportunities for small-scale fodder farmers provided they increase productivity, reduce cost of production, improve fodder quality and safety, and enhance efficiency in marketing. Efforts towards achieving quantity and quality pasture and fodder standard are therefore important.

Focus and target of the intervention

Development of the fodder hay standard was spear headed by the Ministry of Agriculture, Livestock and Fisheries (with support from the Regional Pastoral Livelihood and Resilience Project – RPLRP) and was prepared by the Animal Feeds Technical Committee under the guidance of the Standards Projects Committee in accordance with the procedures of the Kenya Bureau of Standards - KEBS. The Standard developed was in two parts namely;

- i. Grass hay
- ii. Legume hay



The Fodder hay standard will help to realise the following objectives:

1. To protect the health of livestock and to enable livestock producers to achieve expected levels of performance by delivering hay of consistent quality to animals.
2. To contribute to the delivery of livestock products of consistent and appropriate quality to enable livestock producers to market food commodities that meet national, regional and global food standards.
3. To set the minimum nutritional, weight/ volume and safety requirements of commercial hay in order to facilitate trade domestically, regionally and internationally.
4. To develop a fodder hay standard for the country in readiness for EAC regional harmonization.

Implications for fodder value chain development

- The standard provides guidelines for the nutritional, weight and safety requirements of fodder hay in order to facilitate trade and provides for a quality and grading system that is both locally and internationally recognized.
- Fodder hay standard will help to strengthen the regulatory framework governing production, processing and marketing of fodder hay thus protecting farmers from unscrupulous market actors.
- The fodder standards will further help farmers explore the significant market opportunities by addressing fodder quality and safety issues.
- Such a standard is also important considering that the livestock industry is faced with emerging challenges ranging from consumer awareness demands, as well as global feed and food safety concerns for enhanced animal product quality.

NATIONAL FEED INVENTORY AND FEED BALANCE: THE CASE OF 23 ASAL COUNTIES



**Dr Stanley
Mutua**

**Head of Animal Feeds - Ministry of
Agriculture, Livestock and Fisheries**

Under the current global climate change and variability challenges, every Country needs to be aware of its feed resources availability, demands and supply gaps, implications; and also determine how to best address the identified feed gaps at county and national levels and institutionalization of a feed security system (alongside the national food security system).

Driven by the management quote that: 'If you cannot measure it, you cannot manage it', a pre-requisite for making the best use of available feed resources is to accurately assess their availability at county level along with their nutritive value. The assessments of current and future supplies and demands for livestock feed are needed for county and national food security planning, decision-making and policy formulation and, as well as for setting of environmentally sustainable stocking rates.

Data and information generated from livestock feed inventories presents immense utility for policy makers, government agencies,

NGOs, intergovernmental agencies and development agencies in formulating and implementing sustainable livestock-development action plans and for preparing and coping with climatic change and variability, such as droughts. Feed assessments are also expected to inform decisions related to the nature and quantities of commodities, the feed resources that could be traded locally and the potential areas for feed markets.

The feed inventory and feed balance contributes to the Data and information pillar identified as key during the 1st National fodder conference of December 2017.

Focus and target of the intervention

Focus of the intervention was to develop feed inventory and feed balance for the 23 ASAL counties of Kenya. The Ministry of Agriculture, Livestock, Fisheries and Irrigation in collaboration with FAO and CIFA organised a series of training workshops (Part I and II) to strengthen the Feed Security System in Kenya. Twenty three ASAL counties which were grouped in to 5 clusters according to livelihoods were involved in the assessment as follows;

1. Pastoral North East (PNE)-Tana river, Garissa, Isiolo, Wajir and Mandera
2. Pastoral North West (PNW)- Marsabit, Samburu and Turkana
3. Agro-pastoral-Laikipia, Nyeri (Kieni), Kajiado, Baringo, Narok & West pokot
4. South East Marginal Agriculture (SEMA) -Kitui, Makueni, Embu (Mbeere), Tharaka nithi & Meru (Meru North)
5. Coast Marginal Agriculture (CMA)-Lamu, Taitaveta, Kilifi & Kwale

Several tools were employed in the development and implementation of the feed inventory and balance assessment. These include:

- Excel-based models for 'estimation of dry matter, metabolizable energy and crude protein requirements of different animal species and tools for feed security assessment at ward/ livelihood and household levels.
- Excel-based tool for collecting data on potential feed inventory
- Word-based tool for collecting field data on 'competitive uses of feed resources
- Excel-based tool for converting 'potential feed inventory to actual feed Inventory
- Word-based template for capturing 'county-level information on feed industries, feed suppliers and other actors in feed value chain
- LandPKS app synchronized with Predictive Livestock Early Warning System (PLEWS) for calculating the amount of grazing biomass across counties.

Methodology

Several tools were used in the feed inventory assessment. These were: an Excel-based tool for collecting data on 'potential feed inventory'; a Word-based tool for collecting field data on 'competitive uses of feed resources'; an Excel-based tool for converting 'potential feed inventory to actual feed Inventory';

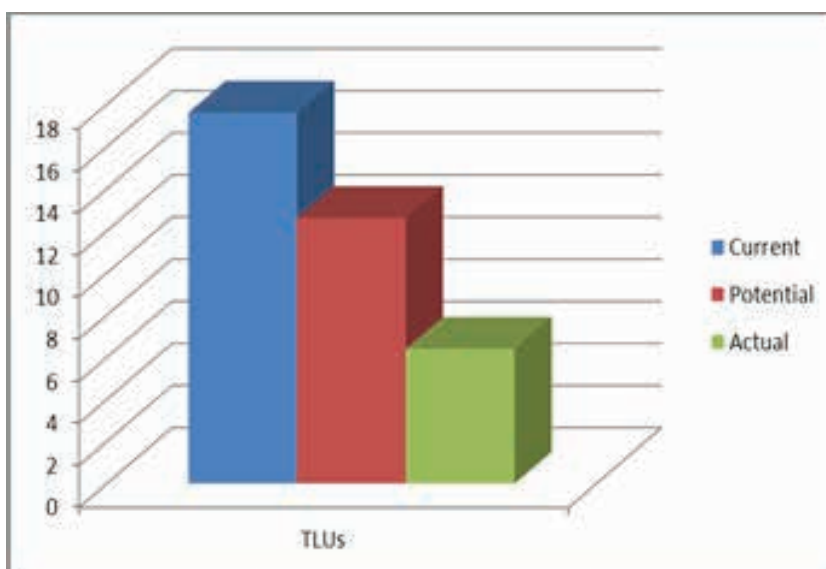
a word-based template for capturing 'county-level information on feed industries, feed suppliers and other actors in feed value chain'; and an Excel-based models for 'estimation of dry matter, metabolizable energy and crude protein requirements of different animal species.



Achievements\ Results from the intervention

Total potential and actual feed availability and use on dry matter basis for the 23 ASAL counties region was 29 and 15 Million tons respectively. Specifically:

1. Actual feed availability and use was 50% of total potential feed availability across the 23 ASAL counties.
2. Grazing biomass contributed > 55% of the total feed use in 14 counties and > 80 % in 10 counties.
3. ASAL region recorded negative feed balance based on actual DM, ME, and CP by 56, 73 and 52 respectively



Conclusion

1. Grazing biomass (includes browse) forms the mainstay of the feed resources of ASAL Counties necessitating measures for proper management.
2. A common observation for most counties is that, based on actual feed availability and use in the grazing land, stocking rate exceeds the carrying capacity, suggesting overstocking and overgrazing hence the need for increasing off-take, destocking, improving feed availability or livestock migration
3. In the Coastal Marginal Agriculture counties the stocking rate was below the land carrying capacity and hence it can support more livestock.

Key messages

- Use of sustainable stocking rates through formulation and use of appropriate guidelines and policies
- Good rangeland management practices e.g. reseeded of denuded lands, rotation grazing and rehabilitation
- Production and strategic storage of straw-based densified blocks and pellets
- Public - Private Partnerships to undertake commercial fodder production
- Provision of forage chopping machines to agro pastoral areas for processing of crop residues
- Processing to alternative feed resources such as crop by product and fruit pulps
- Water harvesting technologies for fodder production

Recommendation

Development of policies and strategies such as County Community Grazing Management, Livestock Trade and Marketing and Rangeland Management; and their alignment at national and county levels regulatory frameworks would provide an enabling environment to realise appropriate technical and institutional options.

Next steps

- With support from FAO-Kenya , the State Department of Livestock is capacity building representatives from the 24 HMRA counties
- Integration of the national feed inventory assessment into County Integrated Development Programs - CIDP
- Strengthen the feed security system at County and national levels
- Integration of the national feed inventory assessment into the national food security system of Kenya (KFSSG)





REPUBLIC OF KENYA



COUNTY GOVERNMENT
OF MAKUENI

Department of Agriculture, Irrigation, Livestock and Fisheries Development
*Office of the executive committee member for Agriculture, Irrigation, Livestock and
Fisheries Development*

Email: ecmagriculture@gmail.com

PROGRESS IN COMMERCIALIZATION OF FODDER IN MAKUENI COUNTY SEPTEMBER 2019



**Mr Lawrence
Nzunga
CECM
Agriculture, Irrigation,
Livestock and Fisheries**

Introduction

As a semi-arid area, the rangeland resources in Makueni County have for decades supported the conventional beef and shoats production systems. In these systems, the herd and flock sizes (and their productivity) fluctuate depending on rainfall patterns that dictate availability of natural feed resources. Subdivision of land has resulted in diminishing rangeland feed resources. This is against a background of increasing number of households with each new family keeping beef animals, sheep and goats. This puts pressure on pasture and browse resulting in overgrazing and resource degradation. Coupled with negative effects of climate change, the threat to livestock has been increasing. Nonetheless the rising human population has exerted an ever-increasing demand for livestock products. Farmers have responded by expanding investment to non-traditional value chains such as dairy production. Consequently, demand for quality pasture and fodder has increased exponentially.

It against this background that the Government of Makueni

County and partner development agencies initiated interventions to address the feed supply gap. The interventions include:

- Capacity building of producers on pasture and fodder resource management skills
- Enhanced/Dissemination of fodder and pasture planting materials
- Mechanization of pasture production and harvesting
- Support to hay business networks
- Coordination of stakeholder efforts in the pasture and fodder value chain.
- Pursuing policy development on land use and spatial planning.

These interventions contribute towards the attainment of the Makueni Vision 2025, Strategic Intervention NO. 8 on Soil and Water Conservation, Range Rehabilitation and Pasture Development. The vision undertakes, among other things, to support range rehabilitation and pasture development and conservation to promote livestock production activities, including dairy farming, ranching, and fattening. A total of 50,000 hectares are targeted during the 10 years. This rhymes well with the national government's agenda on Food Security and Nutrition.

The interventions also feed into **theme of the 2nd Fodder Conference: "Developing sustainable fodder value chain: implications for the Big4 Agenda"**. A functional pasture and fodder value chain would result in sustained production of livestock productions across the seasons.

Focus, targets, and achievements of the interventions

Capacity building of producers on pasture and fodder resource management skills- 2,800 farmers trained across the county and provided with seeds. The varieties of planting material differed depending on the agro-ecological zone.

Range management efforts were also supported. The key activity was training of community-level terrace markers to assist in laying of soil and water conservation structures in rangelands. 240 were trained and equipped. Over 172,500m of terraces laid on pasturelands.

Trainings also targeted silage making with about 500 tons made.

Enhanced access to quality fodder and pasture planting materials. The objective here was to make available quality pasture and fodder materials in all the six sub-counties. Additionally, suitable local varieties were provided to farmers for purposes of pasture land reclamation and increasing land under pasture production. The planting materials distributed included:

- Kakamega II napier variety for hilly masses- 200 stakes- Over 80 acres planted through a bulking approach targeting cooperative dairy farmers.
- Brachiaria spp. The county alone distributed 2,403 bags of brachiaria splits distributed through dairy cooperatives in Mbooni and Kithungo/Kitundu wards. Other partners, notably ILRI and KALRO distributed seedlings as tabulated below.
- Desmodium. 110 kg distributed to farmers in hilly, wetter parts of Mbooni, Kaiti and Kilome sub-counties
- Rhodes grass. Varieties included boma and recently Katombora Rhodes. 1,896kg distributed. Farmers harvest seed and plant in subsequent seasons. Over 600 acres achieved.
- Assorted local grass varieties (Cenchrus Ciliaris, Eragrostis Superba, Enteropogon spp, and panicum spp). 5,753kg seed distributed.
- Fodder agroforestry trees. 22,156 range tree seedlings distributed (Mellia volkensii, leucaena spp)

Over 10,200 acres rehabilitated and put under the various pasture

Mechanization of pasture production and harvesting

Planting and harvesting pasture is labor-intensive. To improve access to the production and harvesting services the county enhanced capacity of the AMS unit with one hay baler, one hay rake, and two tractors.

Nine manual hay balers for one ward to assist youths engage in provision of hay baling services in the hilly areas where tractor based services are not possible.

Over 21,000 bales made last season/year.

Support to pasture seed and hay business networks

- Creating linkages especially between hay producers in Kibwezi east, Kibwezi West, and Kilome sub-counties with main consumer cooperatives in Makueni, Kaiti, and upper Mbooni sub-counties. It is noteworthy that several thousand bales are delivered from Nakuru county in periods of prolonged dry spells such as from June 2019.
- 2 hay stalls constructed in Kithungo/Kitundu ward in addition to 9 rehabilitated with partners (USAID/KAVES)
- Fund set aside to jump-start hay business in Kithungo/Kitundu ward (KES. 200,000 (seed money) for 1000 bales for the newly built hay stalls.
- RTI supporting partners and establishing linkages. They have supported AALE and SPAD to promote pasture/fodder development and link the same with dairies for sustained milk production.



Coordination of stakeholder efforts in the pasture

No	Organization	Area of support	Achievement	Remarks
1.	Large Scale Farms	<p>i) Procure own seeds and meet planting costs</p> <p>ii) 8 farms have baling machinery (4 farms have acquired machinery in the last 2 yrs- Muindi 2 sets, Manthi 1 set, Mutua 1 set, Mwaniki 3 sets)</p>	<p>1570 acres under commercial fodder)</p> <ul style="list-style-type: none"> - 220 acres (4 farmers, each over 50 acres) - 100 acres Sultan estates - 1000 acres Mwaniki - 50 acres Prof. Mulinge - 150 acres Muindi - 50 acres Kituto farm 	Technical advice by county livestock staff (Kilome and Kibwezi sub-counties)
2.	National government	-Baling equipment	1 Mower issued 1 baler issued	Before devolution
3.	NDMA	Provision of seeds	200kg local grass seeds	Cenchrus Spp
4.	KALRO	<p>-Local pasture establishment</p> <p>-Pasture seed harvesting and trade</p> <p>-Rhodes grass (x-tosi) and brachiaria</p>	<p>- Staff and farmer Training</p> <p>-4 range pastures species promoted</p> <p>- Seeds availed</p>	
5.	AVCD/ILRI I	<p>-Training</p> <p>-Planting materials</p> <p>-Manual baling equipment</p>	<p>-880 farmers trained</p> <p>-120 ha of brachiaria established</p> <p>-30 acres of range pastures established</p> <p>-120 tons of silage made</p>	
6.	KAVES	<p>-Training</p> <p>-Planting materials</p> <p>-Rehabilitation of hay stall</p>	-9 hay stores rehabilitated	-2 stores community-owned (Masongaleni & Makiou)
7.	KCDMS (AALE)	<p>-Dairies recruited</p> <p>-Machinery procured</p> <p>-Exposure tours to farmers</p>	33 farmers	Tours to other counties to learn among other things fodder production and utilization

Challenges, Lessons Learnt and Opportunities

- Value chain organizational constraints. The value chain is not yet mainstreamed. Linkages between producers, service providers and markets have gaps to bridge up.
- Inadequate machinery for land preparation and baling. Most grass is not baled at the right time due to few machineries and break downs due to inadequate resources for maintenance.
- Inadequate private sector involvement. Compared to land ploughing services, there are a handful private baling service providers. A vibrant private sector would provide competitive prices and timely services.
- Inadequate planting materials. Both quantities and quality of appropriate fodder materials is wanting. The materials are either unavailable or unaffordable due to high costs
- Inadequate infrastructure to establish strategic reserves.



Implications from the achievements\results

Increased fodder and pasture availability has increased dairy and beef productivity while at the same time evening out the seasonality of production. Makueni dairies milk intake increased from 5,100 liters in 2014 to over 8.600 liters in 2018. These are efforts geared at enhancing the competitiveness of the Kenyan dairy industry as well as the beef subsector.

The fodder value chain has also created a new source of revenue for smallholder farmers in three sub-counties who sell pastures and raw pasture seeds providing an alternative to the chronic crop failures resulting from inadequate rainfall. The grasses are resilient under the circumstances as compared to food crops.

Scalability of interventions and Recommendations

- Scale-up access to quality seeds and other planting materials. Where appropriate, groups should be targeted to ensure bulking of materials and access to fodder management and utilization technologies. The model adopted by ILRI on setting up of brachiaria nurseries performs well in enhancement of access to the technology by producers.
- Enhance private sector participation, especially on mechanization of pasture production and haymaking. The county could come up with a model that subsidizes baling services up to that point when demand can sustain private business.
- Enhancement of hay business infrastructure. Dairy cooperatives should be assisted to expand their dairy shops with bigger hay storage capacity. The dairies can also be assisted with an initial capacity to procure hay. This model can help streamline linkages between producers and farmers.
- Demand for silage technologies and appreciation of its potential



Kenya Crops and Dairy Market Systems Activity

KCDMS Fodder Commercialization Progress Brief

Introduction

KCDMS interventions focus on targeting smallholder farmers in the pre-commercial dairy areas of Busia, Bungoma, Kakamega, Vihiga, Kisumu, Kisii, Siaya, Migori, Homabay, Makeni, Kitui and Taita Taveta Counties that are characterized by low milk productivity. These 12 focus counties of the activity have over the years has been faced with challenges in fodder and animal feed availability which has contributed to seasonality/ fluctuations in milk production. This has adversely affected the growth of both the dairy and fodder industries in the region. Despite past projects' interventions which led to the adoption of dairy farming in the regions, small holder dairy farmers are still faced with the ever-increasing uncertainty in feed and fodder availability.

Through the private sector, KCDMS has identified interventions to improve and increase fodder production across all these counties. This will be done through various innovative models for fodder production and marketing. Through private sector actors, we aim to strengthen fodder seed distribution networks, hay markets and storage systems. In addition, KCDMS has developed inclusive models that have seen youth get into multiplication and distribution of brachiaria seedlings.

KCDMS Fodder Interventions

KCDMS aims to spur market systems development around the fodder and feed value chain through the following interventions;

- Support private sector investment in fodder through grants
- Embedding extension on fodder into agribusiness model; build capacity of farmers through training and extension
- Facilitate farmer access to inputs such as certified seeds through collaboration with major seed suppliers in the region, facilitating seed multiplication and promoting hub development at cooperative level for ease of access to fodder and animal feed.
- Increase farmers' incomes through establishment and trading of seed from fodder and fodder seed multiplication/bulking sites and animal feed to fodder off takers
- Increase sales revenue from fodder
- Promote fodder and animal feed technologies and mechanization
- Promote fodder for gender inclusivity as an opportunity for women and youth – in fodder transportation, marketing, and multiplication.
- Establish structured fodder aggregation and marketing system that will improve linkages between fodder producers and dairy farmers



KCDMS Fodder Grant partners

Grantee	Implementing Counties	Activity
Farmers Fresh Feeds	Makueni	Commercial hay farming, aggregation and market linkages
Mwailu Enterprises	Taita Taveta	Fodder establishment and conservation
SPARD Africa Consulting	Makueni & Taita Taveta	Fodder commercialization
Accelerating Agriculture Livestock Enterprises Ltd	Kitui, Makueni, and Taita Taveta	Developing feed value chain for improved livestock production
Advantage Crops Limited	Kisumu, Siaya, Homabay, Kisii, Migori, Kakamega, Busia, Bungoma, and Vihiga	High performance forage plants for increased fodder and dairy productivity in Kenya
Ndiso Heritage Limited	Homabay and Migori	Commercialization of fodder for feed and livestock production
One Hen Limited	Kisii, Homabay, and Migori	Enhancing dairy based livelihoods in Kisii, Homabay and Migori counties through feed innovation and value chain development approaches
Lengo Agricultural and training center	Kisumu, Siaya, Bungoma, and Kakamega	Commercialization of fodder, dairy technologies and extension services
Osiepe Practical Action CBO	Kisumu, Kakamega, and Bungoma	Expanding fodder and milk markets
Cherehani Africa Ltd	Homabay, Kakamega, and Vihiga	Financing fodder production

Achievements

- Farmer capacity building on GAPs for fodder establishment and management, utilization and preservation for increased benefits (>5000 farmers trained)
- ToTs trained under private sector led extension models to reach out to farmers (26+)
- Demonstration plots established for learning and sharing knowledge and experience on fodder establishment, management, utilization and preservation for increased benefits
- >5000 acres of different fodder varieties established through various models (out-grower schemes, individual farmers, and farmer groups)
- Improved storage facilities at the county level
- **140 acres** of fodder bulking plots established for improved varieties like Napier grass, Calliandra, Desmodium and brachiaria to enhance availability of planting materials for the farmers
- **27,000 farmers** accessed improved fodder planting materials for planting on their own farms
- 665 farmers accessed loans worth **KES 3.7million** for various fodder activities

Women /Youth Inclusion

- Production of fodder – 691 youth planting brachiaria on 170 acres targeting commercial fodder production
- Increased income from fodder
- Job employment opportunities for youth – harvesting services, transportation, and commercial bulking/multiplication (170 acres established)

Challenges

- Political environment at the county level
- Erratic rainfall that has resulted in reduced yields
- Limited availability of clean planting material e.g. improved fodder, indigenous pasture seed for SA2
- Lack of commercially available planting brachiaria varieties of Xarres, Piata and Basilisk that are more resistant to red spider mites compared to the brachiaria hybrid varieties
- Uncoordinated aggregation of fodder

Recommendations

- County governments and KWS to develop grazing and fodder policy that intends to solve the human wildlife conflict for the pastures especially in the drier areas.
- Develop aggregation models that allow information sharing across counties of fodder
- Fast track NPT to commercially release Brachiaria varieties
- Communicate structured framework for certification of dryland pasture seed varieties



KCDMS Fodder Interventions

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 - Build capacity of farmers through training and extension
- Facilitate farmer access to inputs through collaboration with major seed suppliers
 - Increase farmers' incomes through establishment and trading of seed from fodder and fodder seed multiplication/bulking sites and animal feed to fodder off takers
 - Increase sales revenue from fodder
 - Promote fodder and animal feed technologies and mechanization
- Establish structured fodder aggregation and marketing system that will improve linkages between fodder producers and dairy farmers

Women /Youth Inclusion

- 691 youth planting brachiaria on 170 acres targeting commercial fodder production
 - Increased income from fodder
 - Job employment opportunities for youth- harvesting services, transportation, and commercial bulking/multiplication (170 acres established)

Achievements

- More than 5,000 farmers trained on GAPs for fodder establishment and management, utilization and preservation for increased benefits
- 26 ToTs trained under private sector led extension models to reach out to farmers
 - Demonstration plots established for learning and sharing knowledge and experience
- 5,000 acres of different fodder varieties established
 - Improved storage facilities at the county level
 - 140 acres of fodder bulking plots established for improved varieties
- 27,000 farmers accessed improved fodder planting materials
- 665 farmers accessed loans worth KES 3.7million for various fodder activities

Challenges

- Political environment at the county level
- Erratic rainfall that has resulted in reduced yields
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Better Markets, Better Lives

KENYA MARKET TRUST FODDER PROGRESS REPORT

KMT partnered with Eor-Ekule Dairy Limited (EDL) in September 2016 under fodder management intervention in the dairy sector. The objective of the partnership was to scale-up commercial fodder production in Narok County through influencing large-scale farmers to undertake commercial fodder production and address challenges related to marketing, distribution, warehousing and technical knowledge on forage management.

Brief findings

- EDL carried out a market study that analyzed the demand and supply sides of hay markets. Guided by the findings, EDL has developed a number of marketing strategies for the firm.
- The firm has established 760 acres under hay production.
- EDL has sold close to 100,000 bales of hay both to individual farmers and cooperatives. For example, they sell to Githunguri cooperatives society and Ndumberi cooperatives among others.
- Through farmers' field days, EDL has held several farmers' sensitization and awareness creation on hay management and soil conservation. Thus, increasing the usage of hay by farmers.
- EDL has and continue to implement contour ploughing and establishment of soils bunds through terracing in an effort to reclaim degraded lands.
- EDL has introduced innovations leading to improved efficiency. For instance, EDL has now designed two (2) extended tractors which are able to collect up to 400 bales as compared to the past tractors which could only carry 240 bales. This has seen them collect more than double per day (up to 1500 bales per day).
- EDL has put plans in place for diversification. For example, based on the lessons learnt during this partnership, they have started introduction of dairy cows, acquired land and are in the process of establishing the herd.

Challenges and lessons learnt

- Lack of storage facilities: Due to lack proper storage facilities at times they sell hay at throw away prices particularly during rainy and favourable climatic conditions.
- Inadequate equipment and technology: EDL only own one baling machine which is not adequate to bale hay produced from the 700 acres of land. Sometimes, during harvesting season 400 acres of land can be ready for harvesting at once. This leaves them with no option but to hire a baling machine from the county which is an added cost to the farm. On the technology side there are advanced technologies for example drying technologies that can make the process more efficient but these technologies are costly to acquire.
- Transport and logistics challenges has deterred EDL from establishing outlets in other areas where there are great business opportunities like Wajir and the larger northern frontier. This is because it is not cost effective to transport a lorry of hay from Narok to Wajir in the current form of bales which is bulky and can only be transported in small numbers.
- Limited follow up of farmers for scalability: EDL have not been able to carry out follow up with individual farmers who have established hay growing on their farms as a result of their influence.

Recommendations

- Policies on fodder management covering pricing and distribution should be introduced at higher level for example at the government ministries and county departments of agriculture
- The key market players should facilitate the government to establish a strategic storage of hay such that there is enough to address seasonality challenges i.e cover drought seasons and avert livestock deaths.
- Value add hay management through pelleting and compressing. If added value and produced as pellets this will make it easier to distribute the same quality in big numbers in form of pellets or compressed hay. This requires acquisition of the required machines and technologies.





Inadequate access and low-quality fodder are one of the limiting factors in the growth of the Kenyan dairy sector. Thus, enhancing access to affordable and high-quality fodder for dairy producers is critical to transformation of toward a robust, reliable and resilient dairy sector resulting in stable production and better profit margins for producers. The 3R Kenya project, which is a learning initiative collaborated with SNV's Kenya Market-led Program (KMDP) to undertake action research to document and generate insights on emerging market-led innovations linked directly and indirectly to KMDP to assess their potential in addressing fodder availability and quality issues. The studies are:

1. Performance of emerging dairy services agri-enterprises: a case study of youth-led service provider enterprises (SPE)".
2. Potential impact of strategies among Kenyan small- and medium-sized dairy farmers to tackle fodder shortages".
3. "Evaluating the impact of fodder related innovations on farm profitability and environmental impacts in Central Kenya".

Contribution to the 7 pillars from the first NFC in 2017

The insights of the studies can feed into three of the seven pillars from the 1st National Fodder Conference which are:

- i. Research, science, technology and innovations** – The studies contribute to research evidence on extent to which emerging innovations (technical and services) are leading enhanced access to quality fodder and the
- ii. Inputs supply and services** – The studies looked at selected input and service delivery models that are emerging; the case of the SPE study looked into emerging SPE youth-led agri-enterprises that provide fodder-related among other services to farmers as mentioned.
- iii. Emerging and niche fodder markets** - Linked to the pillar above, the studies provide insights on the evolving fodder markets that are stimulating the input and service delivery businesses.



3R Kenya Project

3R Kenya (Resilient, Robust, Reliable. —from Aid to Trade) project is a learning initiative supported under the Agriculture and Food and Nutrition Security (FNS) program of the embassy of the Kingdom of the Netherlands. 3R Kenya seeks to assess evidence and lessons from FNS and other related programmes that support competitive, market-led models in spurring agricultural development with a focus on aquaculture, dairy and horticulture sectors. 3R is executed at a time when Dutch government's bilateral relations

in Kenya are transitioning from a focus on Aid to Trade and the agrifood sector in Kenya. Through evidence generation and stakeholder dialogue, 3R seeks to contribute to an understanding of effective conditions for sustainable inclusive trade for transforming resilient, robust and reliable agri food sectors.

3Rs

Resilient: dynamic and adaptive capacities that enable agents and systems to adequately respond to changing circumstances.

Robust: systematic interactions between agents that enable them to adjust to uncertainties within the boundaries of their initial configuration.

Reliable: the ability of a system or component to perform its functions under changing conditions for a specified period of time to create opportunities for (inter)national trade

Focus of the interventions and results

a. Performance of emerging dairy services agri-enterprises: a case study of youth-led service provider enterprises (SPE)

The SPE is an innovative youth-led business model in which young men and women form groups to offer commercial support services to entrepreneurial smallholders and medium-scale dairy farmers. The SPEs' main value proposition is to offer silage making services to address the feed and fodder challenge facing dairy producers. The SPEs were initiated as a pilot in 2010 and later scaled up through SNV's Kenya Market-led Dairy Program. A total of 29 groups have been established in a number of counties including Baringo, Meru, Nyandarua, Nyeri, Nyandarua and Kiambu. The SPEs are linked to dairy farmer cooperative societies (DFCSs), as the potential client base. It was envisaged that the services offered would enable the SPEs establish vibrant, income generating businesses.

The 3R Kenya project collaborated with KMDP to assess the performance of the SPE model along two dimensions- the technical and entrepreneurial performance. The technical performance looked at the effect of the SPE services on the clients' improved productivity, income and effects on the supply chain. The entrepreneurial performance looked at the business outcomes of the SPEs. Eight SPEs in four counties were sampled for the study.

The results show that in general SPE services have contributed positively to the dairy supply chain where they are operational. Most SPEs enlarge their service officer beyond silage. The eight SPEs made an estimated total of 11,268 tonnes of silage in 2016 (figure 1). Most of the silage produced was maize.

However, there were huge variations in the different regions, with Meru SPEs performing better. On milk productivity, farmers who had received SPE services reported nominal increases of about 2-4 litres per cow per day. This indicates that improving the technical performance of SPEs needs further focus. There were various technical challenges facing SPEs that affect their optimal performance including lack of proper and quality equipment, limited access to fodder seeds, drought and farmers poor practices in handling silage and skill gaps.

On entrepreneurial performance, the results show the SPEs offered their services to many farmers with a variety of services but had a limited reach of their clients, providing services to only 7% of the potential client base. Some groups invested in machinery to grow their business.

Investments include the purchase of new and efficient silage-chopping machinery (about KES 100,000-165,000) which resulted in more silage making opportunities. Silage-making services made up the larger portion of SPEs' income, with the highest earnings averaging about KES 46,500/month per person and the lowest was about KES 5,300/month. Overall, it was noted that SPEs' inadequate entrepreneurial skills limited their marketing and ability to grow their business. The main entrepreneurial challenges were difficulty in determining appropriate costing or pricing of services, slow farmer adoption of services, delay in payment for services and marketing.

b. Potential impact of strategies among Kenyan small- and medium-sized dairy farmers to tackle fodder shortages

There are growing interventions including those supported by KMDP to enhance access to fodder through commercial fodder production and marketing models for smallholder, medium and large scale dairy farms. A key intervention has been support for the growing - commercial fodder producers (CFP) to increase fodder production and marketing. Additionally, the interventions included providing extension and advisory support to CFPs to improve production of quality of fodder.

3R conducted a study to look indirectly at the above intervention to understand if new strategies by small- and medium-scale dairy farmers to tackle fodder shortages (namely: buying fodder and enhancing their own fodder production, e.g. through silage contracting services) resulted in a more stable dairy production and better margins for dairy farmers and commercial fodder producers. The study surveyed 351 smallholder and medium scale farmers in Meru and 72 medium scale farmers in Meru and Uasin Gishu Counties.

Results from the study show that in Meru County, the majority of farmers bought fodder during the last farming season, while in Eldoret most medium-scale farmers produced their own fodder. According to key informants in the fodder market, fodder is more available on the market now than a few years ago. However, although access to fodder increased over the last five years, for the majority of farmers, fodder availability is still a problem in the dry season, as well as limited access to financing to invest in appropriate machinery.

The results also show purchasing or producing extra fodder for the dry season is indeed related to a more stable dairy production throughout the year. However, this relationship only exists among small-scale farmers and not among medium-scale farmers.

Medium-scale farmers seem to have better fodder preservation strategies and they are thus less affected in the dry seasons than small-scale farmers.

c. Evaluating the impact of fodder related innovations on farm profitability and environmental impacts in Central Kenya

This ongoing study aims to evaluate and compare the impact of fodder related innovations by KMDP on the profitability and environmental footprints of smallholder and medium scale market oriented dairy farms in Kenya. A total of 60 farm in Central Kenya (Nakuru, Bomet and Nyeri Counties) are to be assessed. The targeted interventions for the study include a) farmers accessing SPE services b) farmers accessing maize train or silage making services c) farmers receiving feed rationing and formulation support services using Rumen8 software.

The study evaluates the impact of various feed innovations in improving the feed utilization efficiency through high quality forages and alternative feed practices. The study looks at how these innovations have an effect on farmers' income and the extent to which their adoption affects GHG emission.

Implications from the results

The results of the studies provide a number of implications related to emerging business models and strategies for addressing the challenges of access to quality fodder for small and medium scale farmers.

- **Positive contribution of emerging service and input models to development of the dairy value chain** - These studies provided insights into the relationship between fodder availability and stable milk production, and described strategies to tackle fodder shortages, particularly during the dry period.
- **Enhancing access to quality fodder** – These studies provide evidence of the different strategies for enhancing access to fodder. This includes enhanced production and marketing.

The results indicate that these strategies need to be more systematically promoted.

- **Availability of land as bottleneck to fodder production** – While enhanced production of fodder crops is key, land is a bottle neck in some regions. Innovative solutions to this limitation can be addressed through approaches such as leasing of land.
- **Improved access to fodder and advisory support services** - Among the differences observed among fodder buyers and non-fodder buyers is that the former seek extension services more frequently and they trust dairy-related institutions more. This indicates that access to extension and others services can

Scalability of interventions

The research has shown that while the models have important ingredients to tackle fodder and feeding challenges in the dairy sector, they face some bottlenecks that limiting the potential for scaling.

- To accelerate sustainable commercialisation of dairy farming, addressing both the technical and entrepreneurial aspects of the emerging business models such as SPEs and CFP. Scalability of these models are pegged on the mutual goal of addressing access to quality feed and fodder challenges facing dairy producers and demonstrating a strong business case as enterprises in ways that ensure quality and increased quantity of fodder.
- More effort should be put in strengthening fodder and forage market systems by linking demand and supply in seamless ways. This is not only in relation to quantity but also quality of the fodder.
- There is a need to promote research and innovation on the technical aspects related to fodder/forages that can enhance sustainable productivity.

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The brief is a summary of a more comprehensive research report available at <http://www.3r-kenya.org/> and at <https://doi.org/10.18174/476559>.

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ACCELERATING AGRICULTURE AND LIVESTOCK ENTERPRISES (AALE) LTD

Introduction

Accelerating Agriculture and Livestock (AALE) Ltd is a Kenya Company registered in 2017. The company works in partnership with private and public sector to accelerate large scale, sustainable market systems development in the Pasture and fodder value chains. The company objectives are realised by assessing and intervening on the underlying impediments, while improving capacities and relationships that are critical for development. The rearing of dairy and beef cattle is one of the most predominant economic activity and source of livelihoods, food and nutrition for rural households in Kenya. The sector is however faced by occasional and seasonal fodder shortages that limit livestock productivity

and profitability due to low production to meet the market demand for fodder in the country. The fodder shortages are mainly attributed to changing climatic conditions, degradation of pasture land, changing land use dynamics, limited fodder establishment and conservation and limited technology adoption which affect feed availability. The AALE is working with cattle rearing communities to address the fodder deficit by focusing on three of the seven 7 pillars critical to developing the fodder value chain identified during the 1st National Fodder Conference. These include (i) Pasture and pasture seed production, (ii) Emerging and niche fodder markets and (iii) Post-harvest handling, quality and fodder safety.

Focus and target of the intervention

AALE is working with communities in Makueni, Kitui and Kajiado counties to increase fodder availability and develop fodder markets. To increase fodder availability, interventions include;

1. Technical capacity building of the fodder farmers on; natural pasture improvement, range pasture establishment; pasture seed production, processing and storage; fodder establishment and selection of various varieties based on agro-ecological zones, harvesting, conservation and utilization. AALE has a team of experts in animal nutrition, pasture/fodder establishment and conservation.
2. Developing fodder markets by organising farmers into fodder producing groups and pasture seed producing groups. This enables the small-scale producers to aggregate their produce for marketing and price negotiation. AALE also links the fodder and pasture seed producers to markets while providing training to the pasture seed buyers on establishment. Serving both dairy and beef cattle, AALE works with farmers in high potential areas to grow high nutrient fodder crops including *Brachiaria*, *Desmodium*, *Lucern* and *Maize for silage*. For the drier parts of the target counties, the company focusses on Native rangeland forage species *Cenchrus ciliaris* L. (Buffel grass/African foxtail grass), *Eragrostis superba* Peyr. (Maasai love grass) and *Enteropogon macrostachyus* (Hochst. Ex A. Rich.) *Monro ex Benth.* (Bush rye grass) and *Panicum maxim* and fodder trees. AALE has a model farm and is working with over 600 smallholder fodder farmers in an outgrower scheme in Makueni, Kitui and Kajiado counties.

Achievements\ Results from the intervention

AALE has established 30 acres of rangeland grass species in Makueni County, Kitise/Kithuki ward. An additional 670 farmers from 24 fodder groups have been trained and have since established 1,200 acres of fodder and range-grasses. From the establishments, the farmers have harvested an estimated 168,000 bales of hay valued at KES. 33.6 million and 33 tonnes pasture seed valued at KES. 25.5 million for the rehabilitation of degraded pasture lands.

Implications from the achievements\results

Increased fodder and pasture availability is expected to increase dairy and beef production while at the same time evening out seasonality of production throughout the year. These are efforts geared at enhancing the competitiveness of the Kenyan dairy industry as well as the beef subsector. Planting of resilient pasture grasses is expected to create a new source of revenue for smallholder farmers in the ASAL areas which experience chronic crop failures due to poor rainfall performance.

Bottlenecks to attaining the expected achievements

- Inadequate knowledge on fodder/ Pasture establishment and utilization, conservation, storage and utilization
- Insufficient rainfall that can support the full establishment of the fodder including seed viability
- Inadequate, access and poor quality seeds and planting materials
- Low-quality fodder such as hay
- Inadequate irrigation systems for all year round production
- Shortage and poor condition of storage facilities
- High cost and inadequate machines- harvesting, baling many farmers believe pasture grow naturally
- The regulatory framework for pasture seed is not developed

Related opportunities presented by the fodder value chain.

Development of the fodder value chain presents a new opportunity to bridge the fodder deficit in Kenya estimated at 5 billion bales annually, utilize land in the ASAL areas for fodder production to meet the high fodder demand in the country. It also presents an opportunity to create new income sources in areas that hardly support crops due to inadequate rainfall. Further, the fodder value chain presents an employment opportunity for youth applying technology in fodder harvesting and baling and women, particularly on pasture and fodder seed harvesting.



Scalability of intervention and Recommendations

This is a highly scalable intervention that requires technical capacity building of farmers, linkage to quality inputs, and technology to enhance fodder production and rehabilitation of pasture lands.

However, AALE recommends;

1. Close public and private partnerships bring together smallholder farmers, private sector, development partners, research institutions, county government, and national government for policy review and formulation.
2. Identification of available rangelands and other private large scale farms for large scale fodder establishments
3. Technical capacity building of farmers on good agronomic practices in pasture and fodder establishment, including climate smart approaches, harvesting, and conservation to competitively produce quality fodder. Fodder establishment should be marketed as a business opportunity for smallholder farmers.
4. Investment in high nutrient fodder varieties to minimize on commercial supplements thus giving value to both dairy and beef farmers to sustain the fodder value chain.
5. Development of regulatory protocols to govern indigenous pasture seeds certification and trade
6. Development of county-specific land-use policies under rehabilitation of degraded lands in ASAL areas.
7. Investment in sustainable applied technologies including basic mechanization



GREEN GOLD IN THE VASTNESS OF NORTHERN KENYA



Pasture reseeding in Marsabit county's rangeland



Hay harvesting & baling in Isiolo and Marsabit Counties



Hay transportation & trade

Scaling Up Hay Commercialization in the Arid and Semi-Arid Lands

From 2012 to 2018, Resilience and Economic Growth in the Arid Lands – Accelerated Growth (REGAL-AG), a United States Agency for International Development (USAID) program, induced important behavior changes in how pastoral communities manage pasture resources to mitigate the negative effects of drought on their livestock. This was achieved by training individuals and groups on pasture production techniques and awarding business development grants to help entrepreneurs set up pasture production businesses.

REGAL-AG served as a veritable proof of concept in the piloting of fodder and pasture commercialization in Marsabit and Isiolo counties. This commercialization, in turn, has generated economic and livelihood opportunities and built upon REGAL-AG's successes in increasing the competitiveness and efficiency of fodder value chains in Garissa, Isiolo, Marsabit, Turkana, and Wajir counties.

The Feed the Future Kenya Livestock Market Systems Activity, which is leveraging the work of REGAL-AG, has realized early results and paved the way for (1) increased fodder production efficiency, (2) improved hay quality resulting from Kenya Bureau of Standards trainings, (3) expanded hay and pasture value addition due to pelleting and blending innovations, (4) enhanced access to hay equipment and mechanization services, (5) improved fodder and pasture business development and advisory services, and (6) increased access to finance for entrepreneurs and small holders.

Pasture Week: Reseeding of the Rangelands in Isiolo and Marsabit Counties

In partnership with county governments and other development organizations operating in the arid lands, REGAL-AG facilitated trainings and exposure tours to Baringo for fodder producers (grantees) involved in promoting hay production and rehabilitating the degraded lands. Each partner managed specific sites and facilitated and ensured that reseeding by communities took place prior to each rainy season. Under this initiative, the communities reseeded close to 500 acres of land. REGAL-AG also provided business coaching to the fodder producers through Smart Regional Consultants, a local organization, to help them develop solid business plans and processes.

RESULTS & OUTPUTS



LESSONS LEARNED



TESTIMONIAL



REGAL-AG's intervention led to:

- More than 30,000 bales of hay produced annually and growing
- More than 440 acres of reseeded rangelands
- 100 hectares of fodder planted in Isiolo and Marsabit counties
- Hay storage capacity increased to 30,000 bales, thus minimizing post-harvest losses
- Increased demand for pasture seeds in Isiolo and Marsabit counties retailing at Ksh. 1,000 per kg
- Cultural shift from hay “fetching” (from mountain tops and roadsides) to buying hay as a traded commodity from hay producers or established anchor clients
- Increased feedlot and dairy production, providing anchor markets for fodder producers

- Based on the REGAL-AG experience, the Activity is increasing coordination efforts between various market actors through pasture production and procurement of hay during the dry seasons to maximize returns for local hay producers and existing sources and minimize market distortion
- The scaling up of pasture production and commercialization among pastoral communities in Isiolo and Marsabit counties has led to increased access and affordability of hay in all seasons
- The demand for fodder is far from being met in Northern Kenya as well as in the rest of the country

“Pastoralists used to say that grass is the work of God, so why should you try to do God’s work? But there is behavior change, and people are coming to me to learn how to start their own hay businesses. The workload of women has also been relieved, as they do not have to go to the mountain tops to gather hay. They come to my farm, and this is one achievement that I feel very proud of.”

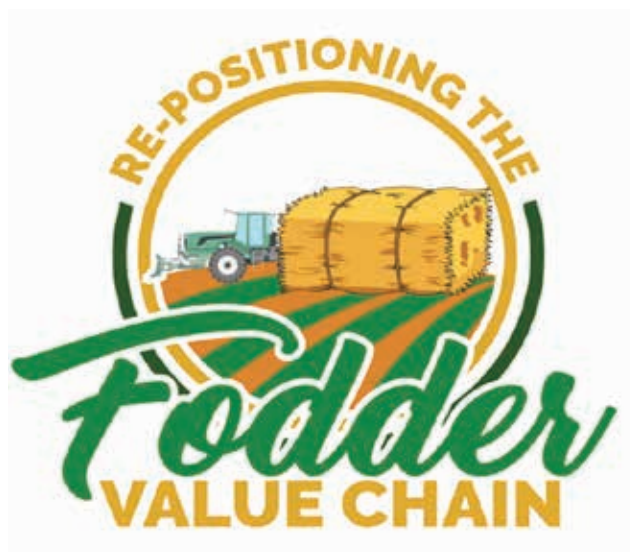
—**Abdulkadir Gulaid, owner of Gulaid Farm Investment in Marsabit County**

Proposed Co-Investment Opportunities In Commercial Fodder Production

Proposed Feed the Future Kenya Livestock Market Systems Activity Business Investments	County	Brief Description
Dokono Ventures Limited	Wajir	Hay production – 5,120 bales per season
Elharar Investment	Wajir	Fodder production under irrigation – more than 6,000 bales per season
Tulu Pasture and Fodder Producers and Livestock Marketing Cooperative Society	Marsabit	Pasture production – between 2,000 to 3,000 bales per season
Kamuthe Young Farmers	Garissa	Fodder production on 30 acres of land

The Feed the Future Kenya Livestock Market Systems Activity is funded by the United States Agency for International Development (USAID) under its Feed the Future initiative for addressing global hunger, food security, and agricultural livelihoods. It is implemented by ACDI/VOCA in consortium with Mercy Corps, The BOMA Project, and Smart Regional Consultants.

For more information, please contact Associate Award / Chief of Party Jean-Frederic (JF) Beauchesne at jbeauchesne@acdivoca.org



Part 4

Strategic Partners Organizational Profiles



MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES

The Ministry has its fundamental goal and purpose of conserving protecting and managing agricultural livestock and fisheries resources for socio-economic development. Its aim is to improve the living standards of people by ensuring maintainance of agricultural livestock and fisheries resources. The Ministry was created in 2013 following the merger of the three former Ministries of Agriculture, Livestock Development and Marketing & Fisheries.

OUR VISION:

A secure and wealthy Nation anchored by an innovative, commercially oriented and competitive agricultural sector.

OUR MISSION:

To improve the livelihood of Kenyans and ensures food security through creation of an enabling environment and ensuring sustainable natural resource management.

OUR MANDATE:

Our Mandate is Formulation, implementation and monitoring of agricultural legislations, regulations and policies Supporting agricultural research and promoting technology deliver Facilitating and representing agricultural state corporations in the government Development, implementation and coordination of programmes in the agricultural sector Regulating and quality control of inputs, produce and products from the agricultural sector Management and control of pests and Collecting, maintaining and managing information on agricultural sector.

CORE VALUES:

To complete the Vision and Mission and build its own culture, the Ministry has identified the following core values:

- Professionalism
- Integrity
- Efficiency and Responsiveness
- Partnerships
- Gender Equity

(Our) aim is to improve the living standards of people by ensuring maintainance of agricultural livestock and fisheries resources.

KENYA CROPS AND DAIRY MARKET SYSTEMS ACTIVITY (KCDMS)



Project Duration October 2017– September 2022

Focus Areas

High-rainfall counties in western Kenya and semi-arid counties in the east

Implementer

RTI International

Partners

Busara Center for Behavioral Economics

East Africa Market Development Associates (EAMDA)

Farm Input Promotions (FIPS)

International Livestock Research Institute (ILRI)

Making Cents International Open Capital Advisors (OCA)

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The Kenya Crops and Dairy Market Systems Activity (KCDMS) is a five-year (Oct 2017– Sept 2022) program of the United States Agency for International Development (USAID). It is funded as part of Feed the Future, the U.S. Government's global hunger, and food security initiative that helps to increase agricultural production and reduce poverty and malnutrition in Kenya. The KCDMS activity is being implemented in 12 counties and is designed to spur competitive, resilient market systems in Kenya's horticulture and dairy sectors.

Kenya is one of the fastest-growing economies in Sub-Saharan Africa. Rising incomes and public and private investments in agriculture lay a strong foundation for Kenya's continued growth trajectory. However, 90 percent of smallholder farmers still grow maize or other staple crops that have low income generation potential. Smallholder dairy producers, who supply 70 percent of Kenya's domestic milk supply, are constrained by nutrient-deficient animal feed, limited quality control and food safety measures, insufficient aggregation and cooling infrastructure, and a lack of productive dairy cows and in-country processing, all of which inhibit agriculture's potential to reduce hunger and poverty. Export and value-addition opportunities in horticulture, although growing, are currently reaching only a fraction of the country's smallholder farmers.

To address these challenges and improve the overall agricultural landscape in Kenya for horticulture and dairy, KCDMS works to support five priority areas:

- A competitive, inclusive, and resilient agricultural market system;
- Diverse agricultural production and improved productivity;
- An improved policy environment for market systems development;
- Integration of women and youth into agricultural market systems; and
- Collaborative action and learning for market systems change and technology adoption.

Eastern Region	Nyanza Region	Western Region
<ul style="list-style-type: none"> • Kitui • Makueni • Taita Taveta 	<ul style="list-style-type: none"> • Homa Bay • Migori • Kisii • Kisumu • Siaya 	<ul style="list-style-type: none"> • Kakamega • Bungoma • Busia • Vihiga

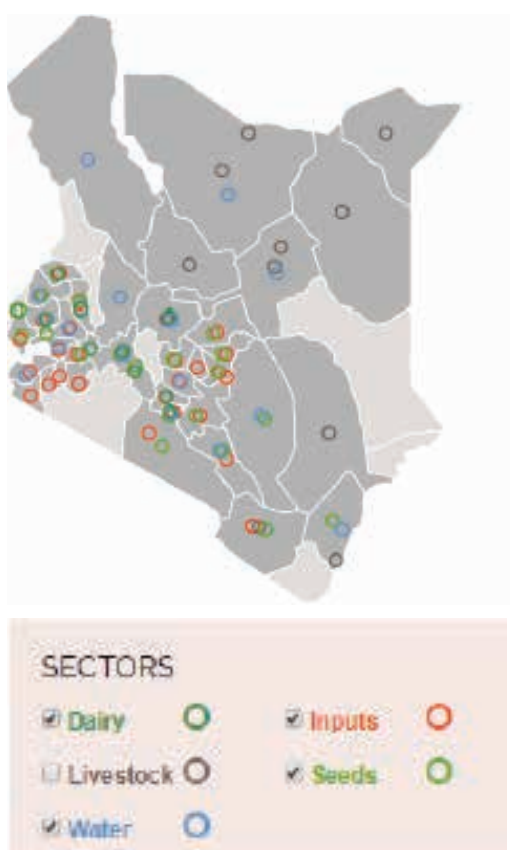
The Activity is strengthening the value chains for dairy, fodder/feeds, and horticulture (mango, passion fruit, avocado, banana, pineapple, and sweet potato). We identify the incentives, attitudes, capacities, and practices that stimulate market players to invest in higher productivity, quality improvements, greater efficiency, and relationships with other value chain actors, and work to facilitate their interactions.

KMT Overview

Kenya Markets Trust (KMT) is a Kenyan organization that works in partnership with the private sector; county & national governments; Associations; Local and International Partners to unleash large scale, sustainable market growth by changing the underlying incentives, capacities and rules that shape how market systems work. We focus on market systems and value chains as

these are the main mechanisms through which wealth is created and growth occurs. Our long-term goal is to deliver large scale, systemic change in selected markets that benefits all players including small businesses, larger firms, investors, producers and consumers, and the country at large.

Sectors Overview



Our Partners

Government of Kenya

KMT provides evidence to national and county governments as the basis for changing the policy and regulatory framework to increase competitiveness and remove distortions in market systems.

Private Sector Partners

KMT works with small, medium and large private sector actors who have the insights and ambition to tap into new market opportunities, particularly where they can serve the base of the pyramid.

Associations

Private sector member associations provide the conduit through which issues affecting their members are articulated. KMT works with these associations to generate evidence and undertake analysis to address bottlenecks in the market systems affecting their businesses.

Global Partners

Kenya can learn much – and has much to offer – in the broad arena of understanding and analysing how market systems can better function and actively seeks partnerships with regional and international thematic thought leaders, research institutions, bilateral government agencies, professional associations, consulting companies and ‘think tanks’.

Dairy Sector

Key Sector Challenges

- Seasonal production due to poor planning on fodder production and conservation.
- Feed availability and quality is a key issue in the industry.
- New regulations have banned trade of raw milk through the informal markets due to safety concerns relating to alleged adulteration and contamination.



The 3R Kenya Project

3R Kenya (Resilient, Robust, Reliable - from Aid to Trade) project is a research and learning initiative supported under the Agriculture and Food and Nutrition Security (FNS) program of the Embassy of the Kingdom of the Netherlands. The 3R project seeks to generate evidence and draw lessons on developing competitive, market-led models for spurring agri-food sector development with a focus on aquaculture, dairy and horticulture sectors in Kenya. The project runs from 2016-2019.

In the dairy sector, the project is implemented in partnership with Wageningen University and Egerton University in collaboration with other partners like SNV's Kenya Market-led Program (KMDP). The 3R Kenya has been collaborating with the KMDP if focused on undertaking applied research to document and generate insights on a number of innovative inclusive business models that seek to address the most limiting factors facing the sector. Inadequate and low quality fodder is one the major constraint that has affected productivity and overall sustainable development of the dairy sector. In relation to feed and fodder, 3R and KMDP have partnered to undertaken a number of applied studies that assess emerging business models of service and input delivery to enhance access to quality fodder for small and medium-scale producers. These studies are:

1. *Performance of emerging dairy services agri-enterprises: a case study of youth-led service provider enterprises (SPE)*”.
2. *Potential impact of strategies among Kenyan small- and medium-sized dairy farmers to tackle fodder shortages*”
3. *Evaluating the impact of fodder related innovations on farm profitability and environmental impacts in Central Kenya*”.

The studies provide important insights on the extent to which these innovative market-led models are enhancing access to affordable and high quality fodder production, and how this consequently contributes to stable milk production and better profit margins for dairy farmers. The collaboration between researchers and development partners provides a good platform for evidence generation on the outcomes and impacts of business approaches to dairy sector development. The insights form a basis for reflection on the scalability, inclusivity and sustainability of the models and the opportunities for investments that can further support robust and resilient Kenyan dairy sector development.

For more details about the studies please visit <https://www.3r-kenya.org/dairy-publications/>



Mandate

KIPPRA has the mandate to provide quality policy advice to the government and relevant stakeholders by conducting objective evidence-based research and through capacity building thereby contributing to the achievement of national development. The institute is an autonomous Think Tank established under an Act of the Kenya Parliament. The Vision of KIPPRA is an international center of excellence in public policy research and analysis.

The overall goal and mandate of the institute is to improve public policy making for realization of national development goals through economic forecasting, policy analysis and research, and formulation of medium and long-term strategic perspectives for socio-economic development. Under the KIPPRA Act, the mandates to be realized are as follows:

- Development of capacity in policy research and analysis and assisting the government in policy formulation and implementation process;
- Exploring and undertaking independent and objective programs of research and analysis such as macroeconomic and interdisciplinary sectoral studies on topics affecting public policy areas such as gender disparity in education and employment, gender disparity in salary and remuneration and social welfare among others;
- Communicating the findings and recommendations of the institutes research programmes to agencies concerned with the implementation of public policy;
- Serving as a point of communication and sharing of views between the government, the private sector and other agencies of the government mandated on matters relating to public policy research and analysis;
- Developing and maintaining a reservoir of research resources on public policy and similar issues and to avail this to the government, the private sector and institutions of learning among other mandates.

KIPPRA carries out its mandate on seven main fields including: social sector such as education; public health and social protection; governance and democratic reform of government and institutions; infrastructure economics and investments; private sector competitiveness; macroeconomic analysis and modeling; trade and foreign affairs; and productive sector such as agriculture and natural resources. KIPPRA is a leading Think Tank in Sub-Saharan Africa.

Contribution to Livestock Policy Development Processes

The Productive Sector/Department at KIPPRA has made contributions to livestock policy and Animal feeds development strategy as follows;

1. KIPPRA was represented at a validation workshop for the National Livestock Policy organized by the Ministry of Agriculture, Livestock, Fisheries and Irrigation
2. KIPPRA played a key role in a panel in a study of Kenya Animal Feed Industry.
3. KIPPRA is ready to participate in studies on the fodder market value chains in Kenya and translate arising issues into further studies to develop insights at the relevant issues, service delivery, legislations and regulations affecting the fodder value chains in Kenya.

COMPANY PROFILE

ACCELERATING AGRICULTURE AND LIVESTOCK ENTERPRISES (AALE) LTD

About us

Accelerating Agriculture and Livestock (AALE) Ltd is a Kenya Company registered in 2017. The company works in partnership with private and public sector to accelerate large scale, sustainable market systems development in the agriculture and livestock sectors. This is done by assessing and intervening on the underlying impediments, while improving capacities and relationships that are critical for development. We focus on enterprises in agricultural markets as the main mechanism through which wealth is created to impact poor rural livelihoods. AALE directors and partners have over 20 years of extensive experience in the agriculture sector focusing in facilitating business development.

Our Values

- Service
- Excellence
- Innovation
- Integrity

Our goal

To play a lead role in transforming agro-enterprises through technologies, innovations and practices to competitively increase productivity and access to sustainable markets resulting to increased regular incomes and poverty reduction for small holder farmers and communities.

Our Vision

Touch, transform and prosper livelihoods.

Our Mission

To transform agro-enterprises through technologies, innovations, value addition and best practices to competitively increase productivity and access to sustainable markets hence improving livelihoods for smallholder farmers.

What we do

Develop inclusive business models leveraging on community potentials, information and technology to address systemic bottlenecks, generate economic growth, improve health and alleviate poverty address

systemic bottlenecks, generate economic growth, improve health and alleviate poverty. Set up effective and efficient platforms for competitive and unparalleled technical service delivery to target customers.

Upholds standards while working with development partners and government institutions to formulate, enact and administer sound policies that facilitate production of safe and competitive agricultural produce.



Our Competencies

- Agro-enterprise training on good agriculture practices
- Agriculture Production, mechanization and Commercialization.
- Value Addition and agro-processing.
- Food safety and quality management
- Feasibility studies to guide investment
- Agri-business management
- Facilitating strategic marketing and finance linkages.
- Policy and governance

Current Activities

- Established over 1200 acres of fodder and pasture by working with 900 smallholder fodder farmers to scale up production, harvesting, conservation and marketing.
- Providing mechanization and transport services to smallholder fodder and dairy farmers
- Providing technical advice to the dairy industry.

Our partners

Smallholder farmers, private sector, development partners, milk processors, research institutions, consumer organizations and government institutions.

FEED THE FUTURE KENYA LIVESTOCK MARKET SYSTEMS ACTIVITY



The aim of Feed the Future Kenya Livestock Market Systems Activity, which operates in Garissa, Isiolo, Marsabit, Turkana, and Wajir counties, is to strengthen people's resilience to shocks and stresses and reduce the prevalence and depth of poverty, household hunger, and chronic undernutrition. This is done by taking collective action on economic opportunities, and by strengthening institutions, market systems, governance, and human capital.

Leader Award

The Leader Award (Leader) establishes an effective management platform that maximizes:

- Transformation of the livestock sector through a holistic approach that catalyzes economic growth and builds resilience among northern pastoralist communities
- Resilience learning capacity

Through joint strategizing and work planning, the Leader will facilitate sequenced, layered, and integrated action across awards and with other keyactors. Through PREG coordination activities, we will facilitate resource sharing and exchanges among counties and implementing partners.

Within the Activity, two associate awards create mutually reinforcing market and human capital opportunities.

Expanding and Diversifying Viable Economic Opportunities: Associate Award 1 (AA1)

The Expanding and Diversifying Viable Economic Opportunities (AA1) provides market-based pull by:

- Facilitating a more competitive livestock value chain for pastoralists moving up in the livestock market system
- Creating viable, diversified livelihood opportunities for those moving up or out of the sector

Activities are layered with those of the Strengthening Community Capacities for Resilience and Growth (AA2) project.

ACDI/VOCA and partners BOMA Project and Smart Regional Consultants are implementing AA1.

PROGRAM OVERVIEW:

- \$45 million over a five-year period
- One leader and two associate awards, potential for additional awards
- Partners: ACDI/VOCA, Mercy Corps, BOMA Project, and Smart Regional Consultants

CONTACTS

Chief of Party Leader

Award:

Ian Schneider,
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Chief of Party Associate

Award 1:

Jean-Frederic (JF) Beauchesne,
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Chief of Party Associate

Award 2:

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Strengthening Community Capacities for Resilience and Growth:

Associate Award 2 (AA2)

The goal of Strengthening Community Capacities for Resilience and Growth (AA2) is to increase community capacities necessary to achieve inclusive and sustainable growth. Its approach couples:

- Institutional and community initiatives designed to strengthen resilience capacities
- Improvements in human capital designed to improve health, nutrition, and WASH practices
- Creating enabling environment for economic opportunities

Mercy Corps is implementing AA2, with BOMA Project providing technical assistance for the Rural Entrepreneur Access Activity Project (REAP) in Garissa, Turkana, Wajir counties.

ACDI/VOCA is an economic development organization that fosters broad-based economic growth, raises living standards, and creates vibrant communities. Learn more about ACDI/VOCA at www.acdivoca.org.



SVN Kenya

SNV Netherlands Development Organisation <http://www.snv.org/> is a Dutch based International Development Organisation that provides market based solutions for the poor through local institutions and organisations in 28 developing countries in Asia, Africa and Latin America. In Kenya, SNV has offices in Nairobi, Eldoret, Nanyuki and Kakuma.

Working in Agriculture, Energy, and Water, Sanitation & Hygiene, we have built a long-term, local presence in Asia, Africa and Latin America. Our global team of local and international advisors works with local partners to equip communities, businesses and organisations with the tools, knowledge and connections they need to increase their incomes and gain access to basic services – empowering them to break the cycle of poverty and guide their own development.

KENYA CROPS AND DAIRY MARKET SYSTEMS ACTIVITY ANIMAL NUTRITION STUDY SUMMARY

INTRODUCTION

The dairy industry is one of the most dynamic agricultural subsectors in Kenya, growing at an estimated rate of 3-4 percent annually. The Kenyan dairy value chain is currently valued at over USD 1.9 billion and contributes 6-8 percent of GDP, of which an estimated 80 percent is contributed by smallholder farmers. National milk production grew from an estimated 2.22 billion liters in 2000 to 5.2 billion liters in 2016. Dairy sector growth in Kenya is largely a result of increasing herd size rather than increased animal productivity. Kenya's estimated average annual milk production of 1,017 liters/milking cow (1,187 liters/milking cow for improved breeds) is poor by any standard, and less than half of what should be expected from a reasonably nourished crossbred dairy animal.

Nutritional factors are the greatest constraint to increasing ruminant livestock production and productivity in East Africa. Dairy production and productivity are the outcome of a complex combination and interaction of nutritional factors related to animal management and diet. Nutritional issues include macro nutrient imbalances (energy, protein), macro mineral imbalances (calcium, phosphorus), and overall macro nutrient and mineral availability. Sustained increases in dairy production and productivity require feeding both the quantity and the quality of feed needed to provide a balance of essential macro nutrients and minerals beyond what is needed to maintain normal body functions. Cows fed a balanced diet will be well-nourished, healthy, and fertile. Additionally, balanced rations give livestock the ability to manage the nutritional stresses associated with high milk production.

This study assessed the critical dietary and nutritional constraints on smallholder dairy productivity in the KCDMS focus areas. It provides an indicative look at current feeding practices, nutritional status, available feeds, and supplements, and production levels. It considers the potential for reducing ruminant methane emissions intensity and their contribution to Kenya's greenhouse gas emissions (GHGs). Finally, the study includes a snapshot of the potential economic impact of improving smallholder feeding practices and overall dairy nutrition.

This study contributes to pillars five and seven of the National Fodder Agri-business Conference:

Pillar 5: Post-harvest handling, **quality** and fodder safety

Pillar 7: Policy, strategy, **standards and regulatory frameworks** and institutions

FOCUS AND TARGET OF THE INTERVENTION

The study objective was to accurately assess the critical dietary constraints to optimal dairy productivity for smallholder farmers in the KCDMS focus areas. The two key study questions were: **(i) what are the principal nutritional constraints limiting smallholder dairy production in the KCDMS areas?** and **(ii) What can the local feed industry do to mitigate those constraints?**

The study used the Ruminant Methane Assessment (RMA) methodology for this analysis. The RMA is a tool for assessing the efficiency of developing country livestock production systems and development projects and is based on the United Nations Framework Convention on Climate Change (UNFCCC) methodology known as **AMS-III.BK**³. The methodology is specifically designed to assess nutritional efficiency and methane emissions from large ruminant production systems in the developing countries of Africa, Asia, and Latin America.

1. Kenya Ministry of Livestock Development, 2010.

2. Generous estimate. FAOSTAT 2018 estimated Kenya's 2016 milk production at 4.1 billion liters.

3. https://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf#AMS_III_BK

The study team collected detailed farm-level data from a sample of 120 smallholder dairy producers in the following counties; Bungoma, Busia, Kakamega, Vihiga, Kisii, Migori, Homabay, Kisumu, Siaya, Taita Taveta and Makueni.

Data was collected on production parameters (genetics, weight, milk production, calving interval) and feeding practices (rations, concentrates, supplements) combined with the nutrient profiles of the rations being fed. This data was used to analyze the nutritional status and productive efficiency of smallholder dairy cattle in the focus areas and identify the principal nutritional constraints. The team also interviewed feed value chain participants in the focus areas to obtain information on feed formulation and nutrient profiles, raw material supply, testing and quality control, and regulatory issues. In addition to information on the use and effectiveness of commonly used dairy meals and supplements, the team collected samples of 15 dairy meals and five supplements and tested them using Wet Chem Analysis to confirm their nutrient profiles.

RESULTS FROM THE INTERVENTION

The following is a summary of the results of this study:

1. Smallholder dairy producers in the focus areas are not feeding enough feed.
2. Most basal rations contain overly mature forages: Ration quality issues arise from the use of overly mature and poorly digestible grasses and legumes. Napier grass, a component in 84 percent of the basal rations, has many good qualities. But producers are feeding it as an overly mature grass, little better than maize stover.
3. Most basal rations contain low digestible, nutrient poor feedstuffs: The inclusion of low- quality crop residues (maize stovers, millet straws, maize cobs, etc.) in the basal rations greatly reduces the nutrient content and balance consumed by the animal.
4. Increased forage production is essential to sustain and increase overall dairy production and productivity: Increasing dairy productivity requires basal rations with both the quantity and quality of forage needed to provide animals with a balance of essential macro nutrients and minerals.
5. Lactating rations are rarely balanced.
6. Dry cows and replacement heifers are fed very poor rations.
7. Kenyan salt/mineral supplements are not formulated to mitigate macro mineral issues.
8. Kenyan producers do not have access to information needed to improve dairy nutrition. The dairy meals are not labelled to inform of the contents and nutrient profile and information on how to use them is not available to the producers.
9. Smallholder dairy producers in the focus areas do not understand dairy production. They are using poor feeding practices e.g. prolonged milking which results in delayed reproduction.
10. The present regulatory system needs to be reviewed and updated to increase dairy production and productivity. The standards for the salt/mineral supplements and dairy meal are not based on current nutritional requirements.
11. Kenyan dairy meals are not formulated to mitigate macro nutrient issues: Dairy farmers in the focus areas have access to a broad range of commercial dairy meal formulated to comply with Kenya Bureau of Standards (KEBS) Dairy Cattle Feed Supplement Specifications.

Kenya Standard (KS) 62:2009, ICS 65.120: Dairy Cattle Feed Supplements – Specification. 2009 (confirmed 2014)

However, the KEBS Standard requires a fresh updating in terms of nutrient profiling and applicability to Kenyan conditions and needs to reflect the nutrient requirements of dairy cows fed tropical forages rather than the current temperate forages. As a result, dairy meals formulated to the KEBS standard are only marginally effective as a supplement for the observed basal rations, and meals that do not meet the standard are rated even lower.

12. Documented evidence on the benefits of using feed products is lacking. Dairy producers rely on word of mouth and on-farm experience to judge the effectiveness of incorporating new feedstuffs into their operations. Producers are generally of the opinion that new feedstuffs are expensive because their effectiveness is so questionable. These conclusions tend to be right because any amount paid for a substandard, ineffective product is – by definition – too much.
13. The two major nutritional issues encountered are:
 - a. **Crude protein (CP) or net energy for lactation (Nel) are the limiting macro-nutrient factors.** Operators with a shortage of protein can reduce the use of overly mature forage, and/or add protein (cottonseed meal, soybean meal, etc.) to the ration. Operators with a shortage of Nel can address forage issues, and feed more high-energy feeds (ground maize, molasses, etc.)
 - b. **Calcium (Ca) shortage is limiting reproductive performance.** The calcium/phosphorus (Ca:P) ratios encountered are generally low, with nearly half of farms below minimum requirements. An imbalance or shortage of Ca can be addressed by adding limestone to the diet or feeding improved dairy meal formulations or salt/mineral supplements with a higher calcium/phosphorus ratio of at least 2.5:1.
14. Overall nutrition management is a multi-faceted issue.

RESULTS

There are a variety of issues facing the Kenyan feed industry. Most are inter-related and will need to be addressed to improve dairy production and productivity. There is also a key structural issue with the forage and fodder value chain which requires attention. The major issues that need to be addressed are:

- i. Forage value chain participants focus on the agronomic aspects of improved forages but completely ignore the nutritive aspects. There is very little information available regarding the nutrient profiles or optimal harvest stage for these new forage varieties, and how they can best be used to improve dairy production.
- ii. For producers to incorporate new forage varieties into their operations, they need to fully understand the nutrient profile of the crop and how to ensure optimal nutrient supply through timely harvesting.
- iii. The Kenyan dairy industry does not have access to the tools and information needed to improve dairy nutrition, production, and productivity. A standard component of producing concentrate feedstuffs for dairy production is ascertaining the nutrient profile of the raw materials used, as well as check testing of the finished product. Access to reliable testing as a quality control measure would ensure that concentrate feeds are better formulated, more balanced, and contain appropriate ratios of significant nutrients.

- iv. The overall purpose of dairy meal standards is primarily regulatory and could be designed to be more supportive.
- v. Kenya Bureau of Standards (KEBS) dairy meal standards need to be updated.
- vi. Feed industry needs to provide producers with access to the information needed to improve dairy nutrition, production, and productivity.
- vii. Salt/mineral supplements in the Kenya market are formulated for temperate climates.



RECOMMENDATIONS FROM THE STUDY

Dairy Value Chain Producer Needs

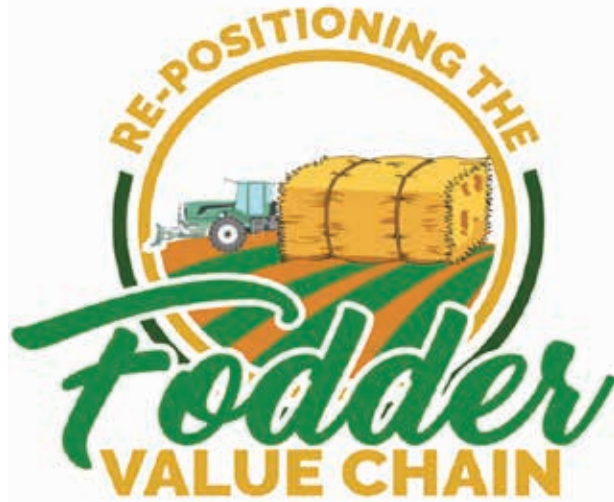
- i. Develop an extensive ruminant nutrition training program focused on developing private sector nutrition advisors.
- ii. Encourage better forage utilization and basal rations
- iii. Provide producers with nutritional information on available/improved dairy meals, and recommendations on the amounts to feed based on the size of their animals.
- iv. Use of appropriate mineral supplements
- v. Access to nutrition advice to advise farmers.

Feed and Forage Value Chain Supplier Needs

- i. Develop a comprehensive industry program to compile information on nutrient content, dry matter production and digestibility, and the costs and benefits of new forage varieties.
- ii. Set up feeding trials that demonstrate the effectiveness of new inputs over the current basal rations.
- iii. Develop commercial laboratory capacity in Kenya to identify what is needed to make available the needed analytical services required by the industry.
- iv. Access to nutrition advisors for the farmers as well as the feed mills to assist in formulation of appropriate feeds for local conditions.
- v. Increase access to information by the feed millers/suppliers on the nutritional status of client dairy animals.

Regulatory Issues

- i. Review, revise and update the KEBS standards to have a new regulatory framework for the industry. Specifically, this framework would:
 - a. Set minimum nutrient profile requirements for dairy meal and supplements
 - b. Specify unallowable ingredients which cannot be included in dairy feeds (for example, blood and bone meal) with reference to international regulations.
 - c. Set upper limits for the presence of certain elements (aflatoxin, non-protein nitrogen, etc.)
 - d. Require a labeling system for feeds and specify the information to be included on labels to inform producers and help them balance their on-farm rations.



Part 5

Conference Program
The 2nd National Fodder
Commercialization Conference

Fodder ni Mali

**“Developing sustainable fodder value chain:
implications for the big 4 agenda”**

Kusyombunguo Hotel, Makueni County, Wote, Kenya.

Tuesday 10th and Wednesday 11th December 2019

Programme coordinators: Dr Stanley Mutua – SDL, Brenda Aluda - RTI and Joyce Mutua – AALE Ltd.

Tuesday, 10th December 2019

7.30 - 9.00	Arrival, Registration and Tea Exhibitions Opening	Fodder value chain Achievements -highlights slideshow Coordination by: Boniface Musembi (RTI)
9.00 - 9.20	Chief Guest Tour of Exhibition	High level delegation
9.00 - 9.30	<p>Opening Ceremony Scene Setting Opening Prayer Introduction of the Participants</p> <p>Session I: “Setting the Stage: Recap of Why the Conference and Recommendations of the 1st National Fodder Conference?” (Secretariat – Joyce Mutua; AALE Ltd.)</p> <p>Panel session: Highlights on key achievements after the 1st NFC</p> <p>Panelists: (Dr. Stanley Mutua-SDL), Rift valley Hay growers (Noah.) County government representative (CEC, Agriculture and Livestock, Makueni County) Development partners (KCDMS) Kenya Markets Trust (Chris Shimba), (STAK/Kenya Seeds (Alphonso Laboso), KEPHIS, KALRO (Dr. Elkana Nyambati) Fodder Farmer</p>	Moderator: Moses Nyabila
9.30 - 10.00	Key note address: Why Kenya needs to develop sustainable fodder value chain: implications for the big 4 agenda	Dr. Milton Ayieko - Tegemo Institute, Egerton University.
10.00 - 10.40	<p>Official Remarks</p> <ul style="list-style-type: none"> • National Anthem • Entertainment by (local band) • Welcome Remarks: Lawrence Nzung’a CEC, Agriculture Irrigation, Livestock & Fisheries Development. • Remarks: USAID- KCDMS • Remarks: Agriculture CECs Caucus Chairperson Mrs. Maria Nzomo • Remarks: Principal Secretary (Harry Kimtai, CBS) • Governor, Makueni County (H.E Kivutha Kibwana) 	Moderator: Moses Nyabila
10.40 - 11.00	Speech and Official Opening of the Conference by Chief Guest	Hon Mwangi Kiunjuri, EGH CS, Ministry of Agriculture, Livestock and Fisheries
11.00 - 12.00	Question and Answer – Plenary session	Coordinator: Moses Nyabila

Programme coordinators: Dr Stanley Mutua – SDL, Brenda Aluda - USAID KCDMS and Joyce Mutua – AALE Ltd.

12.00 - 13.30	Photo Session and Press Conference	Coordinated by Boniface Musembi and PROs
13.30 - 14.30	Lunch	All
14.30 - 15.10	Progress Reports – The 7 Pillars a. <i>Data and information Pillar - MoALF & FAO</i> b. <i>Animal Nutrition Study - USAID/ KCDMS</i> c. <i>Fodder Technologies - 3R Kenya</i> d. <i>KALRO</i> e. <i>NAEDAP (SNV, Agriterra, Bles Dairies, WUR)</i> f. <i>Vital, DigiCow</i>	Moderator: Moses Nyabila
15.10 - 15.30	Question and Answer – Plenary session	Moderator: Moses Nyabila
15.30 - 16.00	Regional milestone assessment on sustainable livestock feed value chain	
	Breakout Session I: Taking Stock: County Cluster Blocks and The 7 Pillars Moses Nyabila	
	Breakout A: North Rift Economic Bloc (NOREB) <i>Moderator: Josephine Kirui</i> <i>Rapporteur: Blaise Okinyi, SDL</i>	
	Breakout B: Central Kenya Economic Bloc (CKEB) <i>Moderator: Catherine Kilelu, 3R</i> <i>Rapporteur: David Maina – Perfometer</i>	
	Breakout C: Lake Region Economic Bloc (LREB) <i>Panelists:</i> <i>Moderator: Vincent Githinji</i> <i>Rapporteur: Dr. Janet Muthusi</i>	
	Breakout D: Jumuiya ya Kaunti Za Pwani (JKP) <i>Panelist:</i> <i>Moderator: Prof. Charles Gachui-UON</i> <i>Rapporteur: Anthony Munyao - SDL</i>	
	Breakout E: South Eastern Kenya Economic Bloc (SEKEB) <i>Panelists:</i> <i>Moderator: Chris Shimba, Kenya Market Trust</i> <i>Rapporteur: Judy Gachora – SDL- RPLRP</i>	
	Breakout F: Frontier Counties Development Council (FCDC) <i>Members: County governments and value chain actors</i> <i>Moderator: Prof. Tuitoek- Egerton University</i> <i>Rapporteur: Joan Otiang-SDL</i>	
16.00 - 16.15	Tea Break	
	All	
16.15 - 17.00	Exhibition Tour by Participants	All Coordination by: Secretariat.

Programme coordinators: Dr Stanley Mutua – SDL, Brenda Aluda - USAID KCDMS and Joyce Mutua – AALE Ltd.

Wednesday, 11th December 2019

8.30 - 8.50	Welcome and Day 1 Recap	Conference Rapporteurs
8.50 - 10.00	Moderator: Moses Nyabila	
	Group Presentation A Presenter: Member	
	Group Presentation B Presenters: Member	
	Group Presentation C Presenter: Member	
10.00 - 10.30	<i>Tea Break</i>	<i>All</i>
10.30 - 11.30	Moderator:	Moses Nyabila
	Group Presentation D Presenter: Member	
	Group Presentation E Presenter: Member	
	Group Presentation F Presenter: Member	
	Group Presentation G Presenter: Member	
11.30 - 12.30	Plenary session: Way forward, Resolutions and Delivery Mechanism Facilitator: Conference rapporteur	
12.35 - 13.00	Conference Communiqué and Closing Ceremony <ul style="list-style-type: none"> • Presentation of the joint communiqué by, Albin Sang, Chairman, 2nd National Fodder Conference Secretariat • Formal closing Remarks–CoG • Vote of Thanks 	Moderator: Moses Nyabila
13.00 - 16.00	<i>Lunch and Departure</i>	<i>All</i>



RE-POSITIONING THE
Fodder
VALUE CHAIN



REPUBLIC OF KENYA



COUNTY GOVERNMENT
OF MAKUENI



The U.S. Government's Global Hunger & Food Security Initiative



USAID
FROM THE AMERICAN PEOPLE

Kenya Crops and Dairy
Market Systems Activity



The KENYA INSTITUTE for PUBLIC
POLICY RESEARCH and ANALYSIS



Prospering Farmers



Better Markets, Better Lives



Robust
Reliable
Resilient
From Aid to Trade

