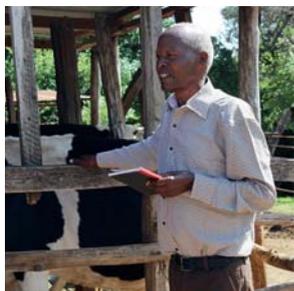




# Dairy matters

Inspiring stories on dairy development in Kenya



Eighteen case studies  
from SNV's Kenya Market-led  
Dairy Programme



Ida Rademaker and Jan van der Lee





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## Credits

### Dairy matters

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## Acknowledgements

This publication - a collection of stories from the field - intends to give an insight into the work that SNV's Kenya Market-led Dairy Programme (KMDP) has been doing over the past four years. This book is a result of the efforts of many people. We are sincerely thankful for the opportunity to collaborate with all concerned and would especially like to thank the people interviewed and the KMDP staff facilitating the interviews and contributing to the document. In particular, we extend our gratitude to Victor Otieno for field work and photography, the proof-readers and editors including David Maina (Perfometer Agribusiness Ltd.), Joep van Mierlo, and Mary Montanus, and all those who have in some way helped to make the publication possible. Credit to whom credit is due!

Most of the stories in this collection describe the changes that dairy farmers have made in their own farms and the impact of their dairy business on their families and peers. After all, development is not about projects, but about people.

Enjoy the read!

Ida Rademaker and Jan van der Lee

## Foreword

The people involved in the Kenya Market-led Dairy Programme (KMDP), implemented by SNV Kenya, are happy to have had the opportunity to positively impact on the lives of many people in the dairy sector in Kenya. Various reports give testimony to this. However, nothing speaks as strongly about the programme's success as the stories of the people themselves. This book takes snapshots of 18 farmers, farmer groups, and companies that KMDP has worked with in order to illustrate the impact made. The stories speak of the changes in farmers' behaviour and attitudes to dairy farming, changes in farm management practices, investments in the farm's, achievements and results, but also of the struggles and difficulties they encountered. There are no easy shortcuts to development!

To get to this point, Ida Rademaker – contracted by KMDP for project documentation and supported by local KMDP staff - has interviewed a range of people in the different regions where KMDP is active. The KMDP team has not only assisted her in facilitating these interviews, but has also contributed a number of cases already documented. The stories in this book are a result of the interviews. Pictures taken by project staff and data available at SNV/KMDP offices were added for illustration and clarification. The people interviewed were then asked to check and validate the stories.

For ease of reading the stories have been grouped into five sections, each with a theme that characterizes the work of KMDP. The first section covers three stories of entrepreneurial smallholder dairy farmers from different dairy cooperative societies. Section two on new entrants in dairy farming focuses on the role of young farmers and gender in the dairy sector by elaborating three stories from young farmers from different regions and one on the role of women in household and business decision-making. In section three the importance of feed and fodder is highlighted by presenting four cases, elaborating strategies and innovations made by smallholder dairy farmers and entrepreneurs in improving access to quality fodder. The four stories under the fourth section show new sources of information and advice that are available to dairy farmers. The last section finishes with three stories about business opportunities that have presented themselves in the dairy service industry.

These case studies represent some of the work of KMDP at farm level and some of the service models that were supported by the programme. We emphasize some, as KMDP works across the dairy value chain and partners with many different actors in the sector. To name a few: small, medium, and large scale dairy farmers, farmer groups and dairy cooperative societies, milk processors, commercial fodder producers, training farms, training institutions, other input and service providers, industry associations, etc. At the primary production level KMDP promotes inclusive formal milk supply chains between farmers, dairy cooperatives, and milk processors; it addresses systemic issues in the industry with stakeholders at sector level; and with international partners it stimulates international linkages to fast-track innovation and knowledge exchange.

For more information on SNV and KMDP, please see the background information included as the last section in this publication and visit [www.snv.org](http://www.snv.org) or [www.cowsoko.com/KMDP](http://www.cowsoko.com/KMDP).

Anton Jansen,  
SNV-Kenya team leader KMDP

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# Locations of case studies



**Lewa**  
A practical training centre



**Jeffrey Samoei**  
A medium-scale dairy farmer



**Samson Kipchumba**  
A young smallholder dairy farmer



**Nundoroto Farm Services**  
An agricultural contracting company

Eldoret



**Jackson Keitany**  
A demonstration plot farmer

Nakuru



**Gogar Farm**  
A commercial heifer and silage enterprise



**Joseph Wakibugu**  
A young smallholder dairy farmer



**Peris Njenga**  
A progressive smallholder dairy farmer



**Ainabkoi**  
A progressive farmers group



**Justus Mutuma**  
A demonstration plot farmer



**Gender Equity**  
The role of women in dairy farming



**Mburu Gichua**  
A commercial fodder producer

# KENYA

● Meru



**Julius Rimberia**  
A progressive smallholder dairy farmer



**Wilson Kanyoi**  
A progressive smallholder dairy farmer



**Imani Farm**  
A medium-scale dairy farmer



**The Bensons**  
A young smallholder dairy farmer



**Bidii Dairy Promoters**  
A silage-making enterprise

# NAIROBI



● Machakos



**Ndumberi**  
A dairy farmers cooperative society



## **SMALLHOLDER DAIRY FARMERS MAKING A DIFFERENCE**

'Two acres of land with crops and livestock, cutting grass with a panga, and two or three tethered lactating cows that produce on average five litres of milk per day for home consumption.' These characteristics of smallholder dairy farmers in Kenya sound unpromising, but times are changing. Smallholder farmers from all parts of the country have become eager to learn about modern dairy farm management. With little capital, but with increasing knowledge and skills about dairy farming, farmers are now starting to invest in their farms and run them as businesses rather than for subsistence existence. Pangas are being exchanged for one row maize choppers, chaff cutters, and pulverizers and smallholder dairy entrepreneurs are building new barns and investing in better breeds of cows. Meet Mr Wilson and Mrs Peris from Central Kenya, and Mr Julius from Eastern Kenya, who have come far in their development, and are currently leading their dairy cooperative societies by example. Read about their main challenges, the decisions they have made and the confidence they have that their investments in dairy farming will continue to pay off in the future.

# A model farmer leads the way

The story of a progressive smallholder dairy farmer in Kinangop, Central region



Mr Wilson Kanyoi

Mr Wilson Kanyoi is a member of Muki Dairy Farmers Cooperative Society and one of its leading farmers. He lives in the town of Engineer, Nyandarua County, about 40 kilometres east of Naivasha. He has 11 cows and a six-acre farm. Four of the cows are lactating, producing a total of 40 litres of milk daily. However, Mr Kanyoi has not always been a leading farmer. Read his story to see how Mr Kanyoi started, what motivated him to change and how KMDP's lead farmer approach has helped him to develop from an ordinary smallholder to a leader among his peers.



Straw bought from suppliers is kept in the barn.

### Milk as potential pension income

Mr Wilson Kanyoi, aged 61, developed the ambition to engage in dairy farming over a decade ago. However, during the first few years, his job in a hospital prevented him from engaging actively in farming. This changed when Mr Kanyoi retired five years ago. He did not want to depend on financial support from his children in order to sustain his wife and himself and decided to invest in his dairy farm to realize a new main source of income.

He started with two local dairy cows that were producing just five litres of milk per day each. The cows grazed in an open field, but also fed on Napier grass, just like his neighbours' cows. Mr Kanyoi was eager to make his dairy farm work, but his lack of expertise hindered him from progressing. In 2013, KMDP selected Muki Dairy Society as one of 18 dairy societies that would receive technical support through its extension activities. Mr Wilson says that he started to attend these extension activities, such as route training sessions and exchange visits, around this time. He remembers that he constructed a zero-grazing unit just as he had seen during an exchange visit organized by the Muki Dairy Society, and stopped using open field grazing. During one of these visits, he also learned how to grow lucerne as a source of protein for his cows. However, Mr Kanyoi still had not learned how to deal with his biggest challenge: providing adequate feed for his cows during the dry season. The lack of feed was affecting his cows' condition and milk production. Mr Kanyoi realized that he needed more up-to-date knowledge and skills in fodder production and management alongside other herd management skills.

*‘Overall, I did not know how I could rear my cows in a way that they would benefit me. I only knew how to produce enough milk for household consumption [...]. I had no idea about making silage and though my cows liked the fresh lucerne, growing it demanded a lot of management that resulted in high costs. Moreover, I still did not have sufficient feed for the cows during the dry periods.’*

### Becoming a lead farmer

Muki’s extension officer and KMDP consultants confirm that in the beginning of 2013, Mr Kanyoi had a poorly managed herd. The feed that the farmer gave his cows was of low nutritional value, young stock was not in good condition and his record keeping was incomplete. In March 2015, Mr Kanyoi was selected to be one of ten lead farmers from the Muki society based on his eagerness to learn more about dairy farming. He attended a week of intensive management training at Willens Practical Dairy Training Centre (PDTC) in Eldoret, facilitated by KMDP (learn more about PDTCs in the case study on Lewa PDTC). The lead farmer approach was implemented with the idea that the trained farmers act as leader farmers who spread new expertise within the group and in their community when they return to their farms. The group made a scheme for rotational monthly visits, where the ten lead farmers invite each other over to their farms. These visits give the lead farmers the opportunity to learn



Mr Kanyoi in his field of lucerne, established after an exchange visit organized by Muki society.

from each other's farm practices – or from invited experts. The last monthly visit was hosted at Mr Kanyoi's farm. During this visit, KMDP dairy consultants demonstrated grass cutting using the scythe.

*'Last Wednesday, two KMDP staff members came and demonstrated to us the use of a scythe to cut Kikuyu grass. It happened on my farm. I invited neighbours and the lead farmers to come and learn. I'm now waiting for the implement to come back [, so I can start feeding my cows]'*.

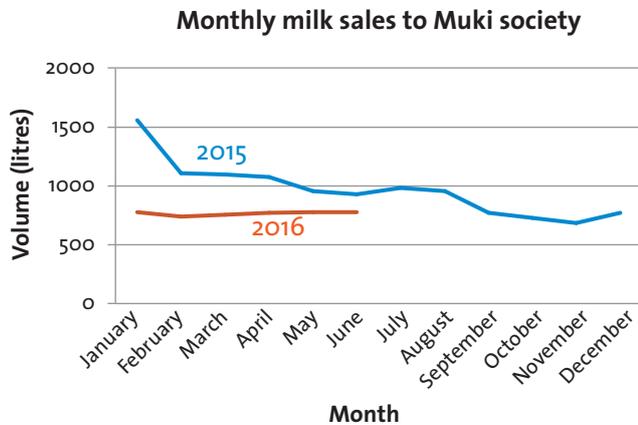
Not only are they learning from each other, the lead farmers also receive a KMDP consultant every month at their farm. The consultant gives advice and sets short-term and long-term farm targets together with the farmers. Mr Kanyoi explained that these individual farm visits have helped him turn around his farm practices.

### This side of the fence ...

After one year Mr Kanyoi was able to improve his feeding practices and his general herd management. Inspired by Willens PDTC, Mr Kanyoi planted one acre of maize and two acres of Kikuyu grass in addition to the half-acre of lucerne and one and a half acres of Napier grass he already had. The PDTC also inspired him to make maize silage. With the help of the extension officer, he managed to grow enough feed to preserve almost twelve tonnes of maize silage. He also bought extra oat straw and hay. He went ahead and constructed a hay shed. Later on, he designed individual calf pens and placed them in the paddock. He uses artificial insemination for breeding purposes and currently the cows have an average calving interval of fourteen months. In late 2015 Mr Kanyoi received a record keeping booklet. Encouraged by the KMDP consultant, the farmer now keeps records, including the daily milk production per cow, the dates of insemination and the dates of tick spraying. To convince Mr Kanyoi about the importance of record keeping, in 2016 a KMDP dairy expert organized a training session for the lead farmers to teach them how to make a cost-benefit analysis.

### ... and both sides of the fence

Mr Kanyoi has found that being a lead farmer can lead to new challenges and insights. One challenge the ten lead farmers faced is that they are geographically widely scattered. They were strategically chosen to represent diverse areas in a dairy society with more than 17,500 registered members. Time showed that distance formed an obstacle to the group's aim to meet monthly. As a result, the group is now split into two sub-groups: four farmers from the south of the society's region (including Mr Kanyoi) and the six others from the northern half. Mr Kanyoi says that he and the other three lead farmers actively exchange knowledge during the monthly visits and these visits continue to give him new insights. He recalls that when his peers visited his farm, they told him to improve his zero-grazing unit. They observed the unevenness of the barn floor and the small size of the cubicles that affected the



comfort of the cows. Improving the zero-grazing unit is now his priority. He also says he feels challenged by the other three lead farmers. Mr Kanyoi is planning to increase his acreage of maize by two acres. He wants to achieve this by leasing some nearby land. With the additional silage, he intends to achieve a stock of thirty tonnes, which should be sufficient for his current herd size. Mr Kanyoi also notices that the other farmers are gradually taking up practices learnt from his farm; for example, one of the farmers started planting kikuyu grass and lucerne after visiting Mr Kanyoi's farm.



Mr Kanyoi constructed two calf pens after observing what pens look like on other farms.



Design issues in the cow shed make the cows uncomfortable - a priority for improvement.

### His cows have 'come home'

Mr Kanyoi is happy with the current progress of his eleven cows. At the time of documentation, the four lactating cows were producing approximately 40 litres of milk per day. This means the cows have doubled their milk production compared to the year that Mr Kanyoi started dairy farming. He says that even during the dry season, between March and May, his cows do not show a significant drop in milk production. As a result of increased production, he has increased income, which has helped him to meet the needs of the family more effectively than before.

*'Overall, I feel more comfortable now, because my income and knowledge increased and my cows are far more comfortable than when I started. When consultants from SNV tell me my cows look well-fed, I feel proud. My farm is now seen as an example. The increased income has enabled me to pay school for my children comfortably. One of my children attends a private university; right now paying the fees is no longer a major challenge for me.'*

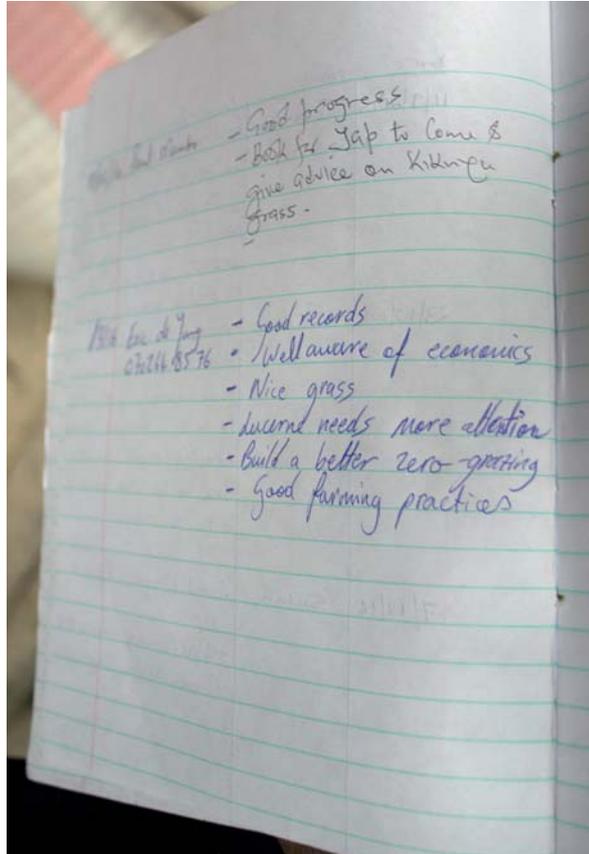
The KMDP consultant praised the progress made by Mr Kanyoi and states that he has become one of the best performing smallholders in the Muki Dairy Society. The farmer employs three workers and together with them, he has improved his farm practices. The farmer states that the milk production per cow increased in 2013 and 2014 as well as the total milk volume. In 2015, however, two cows died and milk production declined. Still, the farmer sees the future in dairy farming as being positive and says that he will benefit from the investments on his farm in the short term. This has also become evident in the farmer's new goals.

### New goals

Early in 2016, Mr Kanyoi set a farm target for the end of 2016. He wanted to reach

a daily milk production of 100 litres. With eight cows waiting to calve, the farmer believes that he will achieve his aim. The monthly visits helped him to realise that he needs to grow more fodder (including high-protein fodder crops), install irrigation, ensile more maize, and improve his zero-grazing unit to achieve this goal. This will significantly reduce the costs of the feeding of dairy meal. Furthermore, Mr Kanyoi wants to find affordable machinery to cut his grass, ensure quality and consistent services from artificial inseminators and animal health assistants. He has also said that he will start using straw for bedding instead of using it as feed. Lastly, he intends to insure his cows to cover the risk in case of any unforeseen deaths. These improvements should help him to also reduce the costs per litre of milk.

Mr Kanyoi was selected as a lead farmer, because he was willing to share his knowledge with other farmers. However, the number of farmers visiting Mr Kanyoi's farm is low, mainly because they do not regard his farm as a training centre. According to Mr Kanyoi, many farmers are also not aware of the progress he has made on his



Notes written by the KMDP's consultant after one of her individual farm visits.

farm. In the future he hopes to organize a training based on his farm improvements. He also suggested that the Muki Dairy Society could play a bigger role in promoting lead farmers by organizing exchange visits to their farms or promoting their dairy farming standards in general. Mr Kanyoi points out two of the many obstacles for other farmers wanting to improve their farm.

*'Some farmers need time to develop sufficient interest to adopt what they have learned. I was very motivated to improve myself economically [...]. When I decided to invest in my farm, I had a better starting position than most other farmers, because I had saved a little money. Some farmers are willing, but they don't have money and that makes it hard for them to start off.'*



Mr Kanyoi used to graze his cows in the field, now he cuts and carries grass to the zero-grazing unit.

## A woman moving dairy

The story of a female farmer training other farmers in Kiambu, Central region



Mrs Peris Njenga.

Mrs Peris Njenga is a typical example of a successful peri-urban dairy farmer. She produces over 300 litres of milk per day from 18 milking cows on a mere half-acre of land. In this peri-urban area, land prices are high, so efficient use of available land is an economic necessity. Despite the fact that the land area is limited, she successfully runs a dairy farm with the skills gained from expertise within the Ministry and from outside. She supplies her milk to a nearby dairy cooperative. Hers is one of the farms that has been selected by KMDP as a host farm for farmer-to-farmer learning.



Mrs Njenga invested in building cubicles for her cows.

### An active entrepreneur

Mrs Peris Njenga, aged 60, started her career as a secretary at the Ministry of Livestock Development. At the age of 45, she resigned to venture into the hotel business. As this business in Nairobi did not do well, she sold the hotel and joined her husband on his dairy farm 15 years ago. The farm is situated near Banana Township in Kiambaa sub-county, Kiambu County, approximately 20 kilometres north of Nairobi. Her husband spent most of his time doing business elsewhere so Mrs Njenga has taken the lead on the dairy farm.

Mrs Njenga has been supplying the Kiambaa Dairy Society all the time she has been a dairy farmer. Since 2007 she has also been active in running the cooperative as the chairlady of the society. With the improvements made on her farm, she can now be considered a medium-scale farmer. Nonetheless, Mrs Njenga has stayed loyal to the dairy society as she wants to lead by example, growing the cooperative's supplier base to 1500 active milk suppliers, and more.

### Sources of information

Mrs Njenga started dairy farming in early 2000. Like many other smallholders, she remembers that she had two main challenges: her lack of skills to manage the farm and her limited land size. She started the dairy farm by establishing forage plots and building a cow shed to house her two cows. As her herd grew, the cow shed became overcrowded and feed quality and hygiene were neglected. These problems were further compounded by lack of proper record keeping.

Over the last ten years Mrs Njenga has been improving her farm progressively. She attributes her initial exposure to dairy skills to her time as an employee of the Ministry. Here, she built strong networks with resourceful personnel. As the cooperative society did not have extension personnel in early 2000, she consulted her contacts at the Ministry instead. They assisted her with the layout for the zero-grazing unit as well as the cow shed construction.

*‘The Ministry by that time was very helpful; they were advising us [farmers] about the construction of cow sheds amongst others. It is regrettable that this support is now reduced greatly.’*

In 2013, the Kiambaa Dairy Society was among the cooperatives that were selected to receive technical support from KMDP. Mrs Njenga interacted with the project from time to time: KMDP consultants visited her farm and she also attended KMDP-supported dairy society training sessions where the consultants and Kiambaa’s extension officer were present. She was eager to improve her farm and the consultants saw that potential, especially as Mrs Njenga’s farm was already relatively further developed than most farms in the area. Since then, Mrs Njenga has received monthly individual visits to her farm by the KMDP’s consultant (see box). Mrs Njenga also attended training and extension visits organized for her and a few other progressive farmers. She has been following advice keenly and says to have benefitted especially



Board with meticulous milk production records in the milking parlour.



Individual calf pens showcase the result of long-term breeding practices.

#### Feedback from a KMDP consultant

'Mrs Njenga is a progressive and motivated farmer. Every time I come here, I witness improvements. Last week I sat with her and we discussed three areas of improvement. Today I can see she has improved all three. She is storing the milking equipment more hygienically and is supplementing her cows properly. Currently she is experimenting with buying a more expensive dairy meal. I told her to test it with three cows and note the difference. She is now doing that'.

from on-farm coaching. The training sessions have given the female farmer a vision of growing the farm to a host farm for demonstrations and training sessions, teaching neighbouring smallholders about good dairy farming practices.

#### From smallholder to medium-scale farmer

Mrs Njenga is now using artificial insemination to raise the quality of her stock, she has improved farm management (especially after employing a farm manager), improved the cow shed by grouping cows according to age and lactation period, and building a separate unit for the calves (see box). She also plants feed crops (maize, lucerne, and soya beans) on her small plot and on 17 acres of leased land in the vicinity. She is now able to preserve enough feed for her 42 cows, of which 18 are lactating and 24 are

**VISITORS FRONT MERU COUNTY**

Date	Name	Company - Address	Comments
2/1/16	KENNETH BISHOP	CEO - OTHMANIYA MEDICAL SUPPLY	Warm welcome and a polite model for people
2/1/16	Simon KIRITA	Chairman N.B.C.U	A well organized team. Thank you
7/1/15	Norman G. Njani	Njiru Division	Good Standard
11/1/16	J.P. Mbugua	Meru County Council	Good - Good work
7/1/16	G. E. Mbugua		
17/1/16	DR. DANIEL MUKHTAR	TELESA F.C.S. OLEMBOKO-NARUBO COUNTY	Well organized keep up the spirit and best u. can
11/1/16	FRANCIS A. KOECH	OLEMBOKO DAIRY FARMERS CO-OP. SOC. NARUBO COUNTY	HERE ON A VISIT TO THIS FARM TO SEE PROGRESS ON THE FARM
11/1/16	FRANCIS A. KOECH	OLEMBOKO DAIRY FARMERS CO-OP. SOC. NARUBO COUNTY	HERE ON A VISIT TO THIS FARM TO SEE PROGRESS ON THE FARM
11/1/16	RENE CHELIMO KOSILEI	OLEMBOKO DAIRY FARMERS CO-OP. SOC. NARUBO COUNTY	Thank you for your warm welcome
11/1/16	MILTON K. A. MURPHY	OLEMBOKO DAIRY FARMERS CO-OP. SOC. NARUBO COUNTY	Thank you for the warm reception by Mr. George Mbugua and his family. Some of the family members are here. I look forward to your visit by the time I visit the farm.

The visitors' book records individuals and groups coming to the farm.

young stock. Both the genetic improvement and feeding of (400 tonnes of preserved) silage as basic feed have helped Mrs Njenga to increase the farm's milk production. She is now also managing her records properly. According to her, increased milk production has led to a significant growth in milk sales. At the time this report was written, records showed that her best cows were producing an average of 18 litres daily, with a total herd production of over 300 litres of milk per day. The Kiambaa Dairy Society paid its members between Ksh 35 and Ksh 38 per litre in the first six months of 2016.

It motivates Mrs Njenga that as a woman, she is leading a progressive dairy society and at the same time managing an upcoming dairy farm that is a top supplier to the Kiambaa Dairy Society. Mrs Njenga's husband is supportive and they are both passionate about the work they do together on the farm.

***'I feel good about being a woman and a farmer. I have the passion for dairy farming. I decided to venture into dairy farming, because I knew I could succeed. My husband has been very supportive and he sometimes helps with constructions. Money from milk is paid to my account, but my husband and I make the management decisions jointly.'***

**Improvements 2013-2016**

- Zero-grazing structures according to age and stage of lactation
- Calf pen unit
- Hay shed
- Leases seventeen acres of land
- Has 400 tonnes of silage preserved
- Improved cow comfort, feeding, and hygiene
- Record keeping in a record book and displayed on boards
- Tested desmodium then shifted to lucerne and soya beans
- Uses artificial insemination
- Has a farm manager
- Has invested in a milking machine
- Buys hay
- Bought fodder chopping equipment.

**Farmer-to farmer learning**

Once Mrs Njenga had improved her farm practices, supported by Muki's extension officer and dairy consultants from KMDP, the three parties decided it was time to invite other farmers to her farm for learning purposes. From the outset she had envisaged her farm as having potential for learning purposes. She had organized the first training herself in 2012. Many smallholder farmers from the Kiambaa Dairy Society have since visited her farm. Mrs Njenga has already received nine different groups of smallholders from the Kiambaa society through the society's (milk) route training sessions. Farmers from other dairy societies have also been visiting the farm since 2014. KMDP consultants and extension officers from Kiambaa assisted her in training the other farmers using her own experience. Through word-of-mouth, Mrs Njenga's dairy farm is currently well-known among farmers in the Kiambaa sub-county. This is not just true for larger groups of farmers, she even receives requests from individual farmers, who call her to schedule visits.

**Some of the groups that have visited Mrs Njenga's farm**

Date	Origin
28/03/2012	Kiambaa Dairy Farmers Cooperative Society
11/02/2014	Cherobu Dairy Farmers Cooperative LTD - Litein, North Rift
28/03/2014	Ethiopia Federal Cooperative Agency
27/07/2015	Meru District Cooperative Union
19/11/2015	Tulaga Farmers Cooperative Society - Lead Farmers
11/12/2015	Olunguruone Dairy Farmers Cooperative Society
18/02/2016	Kitiri Dairy Farmers Cooperative Society
00/00/2015	Ndumberi Dairy Cooperative Society - Lead farmers
11/05/2016	CDLP West Pokot

*'Some time back, I received a group with over 100 farmers organized by KMDP. [...] Yesterday, a farm-owner and his manager visited me. They came and took pictures of the cow sheds.'*

Though the exact number is unknown, numerous farmers from different counties have visited Mrs Njenga since she opened up her farm (see table). According to her farm manager, who was previously a trainee with KMDP, the visiting farmers are often surprised by the quality of Mrs Njenga's cattle stock and her ability to feed the herd consistently with maize silage, all planted on outsourced (leased) land. Mrs Njenga says that farmers often do not want to leave her farm, because they say they want to learn more. A few days after the training, the trainees call her to ask her even more questions. Mrs Njenga believes that she is making an important contribution to other farmers by opening up her farm for learning purposes.

### Future plans

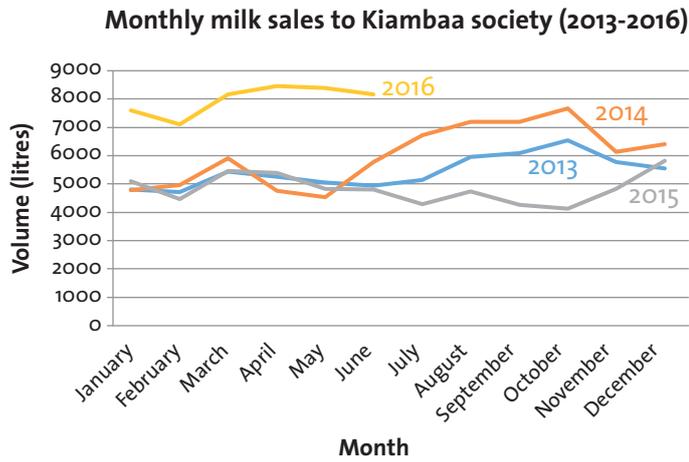
Mrs Njenga aspires to professionalize her farm as a training farm. She would like to train more farmers in more areas of dairy farming. To achieve this, she needs technical and financial support to set up the right infrastructure. Even though Mrs Njenga's dairy farm has progressed further than the typical smallholder in Kiambaa sub-county, it still has room for improvement. For example, the farm manager would like to see

investment in two major areas: the milking parlour could be improved to optimize cow welfare during milking, and increased cultivation of protein-rich feed could reduce the costs that are currently incurred by buying concentrates.

Limited by her small land size, Mrs Njenga's plan is to increase her herd size up to a maximum of 50 animals. The next step for the farm will be to focus on breeding to boost incomes through the sales of in-calf heifers.



Equipment for chopping maize for silage on leased land.



N.B. The data from Kiambaa society show a gradual increase in milk supply.



At the milking parlour with the milking machines.

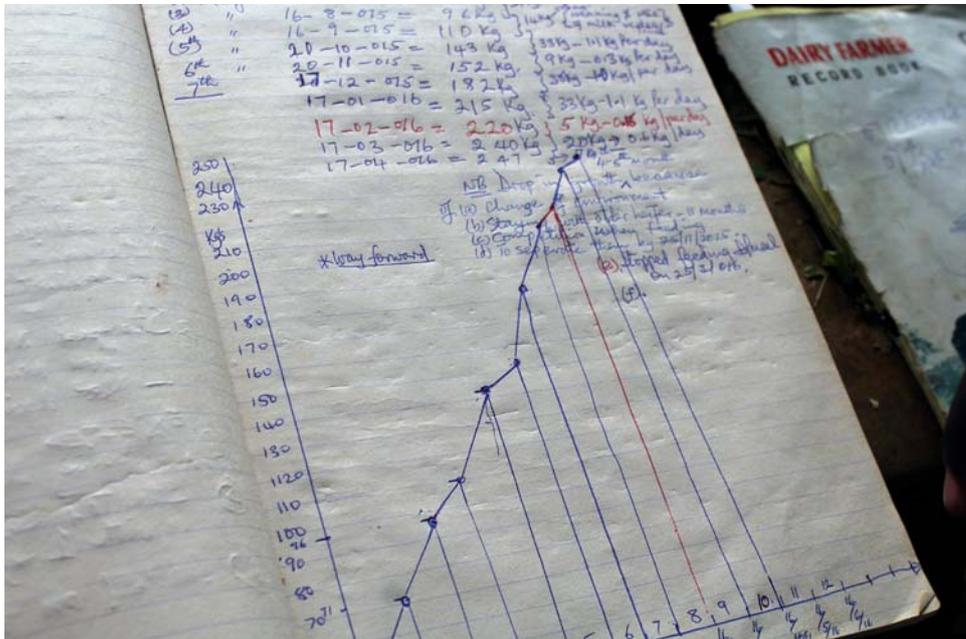
# Life-long learning and teaching

The story of a progressive smallholder dairy farmer in Mbwinjeru, Eastern region



Mr Julius Rimberia.

Mr Julius Rimberia is a member of the Mbwinjeru Dairy Society. He lives in the high potential agricultural area of Mbwinjeru, about fifteen kilometres south of Meru town. He owns two acres of land and has two milking cows out of a herd of eight dairy animals. Jointly they produce an average of 23 litres of milk per day. This story is about how a farmer who has turned his dairy farm from being a side line into the core business for his family. His attitude has made him one of the most progressive farmers in his dairy society.



Mr Rimberia drew this graph depicting the growth of a calf using the measuring line received in 2015.

### Teacher turns farmer

Mr Rimberia, almost 60 years of age, worked as a teacher most of his life. When he retired three years ago, he was looking for another source of income and decided to invest in dairy farming.

*'I used to keep cows to produce milk for home consumption. When I retired from my teaching profession, I needed a source of income and through friends I found out I could actually make money from milk!'*

Living on a two-acre farm with his wife, Mr Rimberia started his venture into dairy farming in 2013 with three cows, two of them lactating and one heifer. He realized that his income from dairy farming was not sufficient for his needs, yet he did not have the means to improve his dairy farm. Half way through 2013, Mr Rimberia heard about the opportunity to attend training sessions organized by the Mbwinjeru Dairy Society, to learn more about dairy farming. These extension activities were organized in collaboration with KMDP. Even though Mr Rimberia had started to dabble in other businesses, he was also gradually increasing and improving his herd-size, especially by breeding using artificial insemination. After attending (milk collection) route training sessions, organized for smaller groups of farmers from one area, his eyes were opened when he joined an exchange visit to a dairy farm in Embu in 2014. This visit was supported by KMDP. Three other exchange visits followed and these convinced him



Mbwinjeru lead farmers graduate from their training at Mawingu PDTTC.

to change his farming practices. He bought seeds for fodder crops and constructed a zero-grazing unit. By January 2015, this teacher-farmer had significantly improved his dairy farm. He had land under maize and Napier grass, and had managed to conserve two tonnes of maize silage from it. Through artificial insemination and a calving interval of 15 months, he managed to improve stock on his dairy farm. By that time the farmer had one calf and five cows of which two were lactating and three were dry. The two lactating cows together were producing 16 litres of milk per day and the dairy society was buying the milk for approximately Ksh 35 per litre. The farmer remembers that he had a monthly income of over Ksh 13,000 in early 2015, which made him feel financially more comfortable compared to the time before he started to concentrate on dairy farming.

### Learning and teaching

The exchange visits and training sessions organized through Mbwinjeru Dairy Society helped Mr Rimberia to improve his farm in 2013 and 2014. However, he was still facing challenges, the biggest being the high costs of fodder establishment and preservation, low potential of the cows in milk production, and the lack of proper farm records. KMDP consultants and Mbwinjeru's extension officer acknowledged Mr Rimberia's eagerness and motivation to improve his farm and also observed that he needed more help to overcome the challenges he was facing. Early 2015, Mr Rimberia was selected as one of the ten lead farmers from the Mbwinjeru Dairy Society. The programme facilitated a one-week intensive training at Mawingu PDTTC in Nyeri (learn more about PDTTCs

in the case study on Lewa PDTC). At the PDTC the lead farmers were trained on nine important dairy topics through class room presentation and practical training. During the training week, the KMDP consultants also encouraged the lead farmers to form a group for the purpose of peer learning. The group received the idea with enthusiasm and elected a core team as their committee. They then established rules and agreed on a rotational monthly visit programme. During these visits, one farmer opens up his farm to the other lead farmers and gives them a tour around the farm. The host farmer invites them for snacks and lunch, while he receives peer feedback on his dairy farm practices. Most of the rotational visits include input from a trainer, either an extension officer, a KMDP consultant, or an input supplier, who is invited to teach them about a certain topic. The lead farmers also receive individual monthly visits from the KMDP dairy consultant, who not only helps them to set targets to improve the farm, but also helps to achieve them.

### Plucking the fruits and facing the challenges

Mr Rimberia is the secretary of the lead farmers group. He is responsible for the attendance of the members and he has been quick to note that a few of the lead farmers are not as active as expected. According to him, only three or four of them showed commitment to improving their dairy farms. This could be attributed to a lack of capital for implementing the things they learn. In the case of female members, he suggests that action is delayed because:



Farmers in Mbwinjeru see Mr Rimberia's zero-grazing cow shed as an example of good practices.



The silage pit is covered with sweet potato vines.

*‘Some women who are lead farmers say they are in discussion with their husbands on raising funds to invest in improving their farms.’*

To address the non-attendance issue, the group’s committee decided to change their strategy: instead of meeting every month, they would come together twice a year and use vehicles to pick up all the lead farmers that might be interested in the group learning sessions. The lead farmers would visit as many farms as possible in one day, keeping the visits short and concise. Mr Rimberia recalled the November 2015 trip when he hosted the other lead farmers. They advised him to improve his breeds while complimenting him for his water facilities, calf pen, records, and feeds. The other lead farmers also advised him to improve his maternity wing, but he had not yet done it due to lack of funds. Mr Rimberia was proud to say that the other lead farmers made a compliment about his silage, which they said was ‘excellent’.

Aside from the rotational monthly visits, the KMDP consultant also visits each individual lead farmer on their farm on a monthly basis. The KMDP consultant remembers that at first, in 2014, Mr Rimberia’s farm lacked many elements of a good dairy farm. Not long afterwards, Mr Rimberia had implemented most of the recommended steps on his farm.

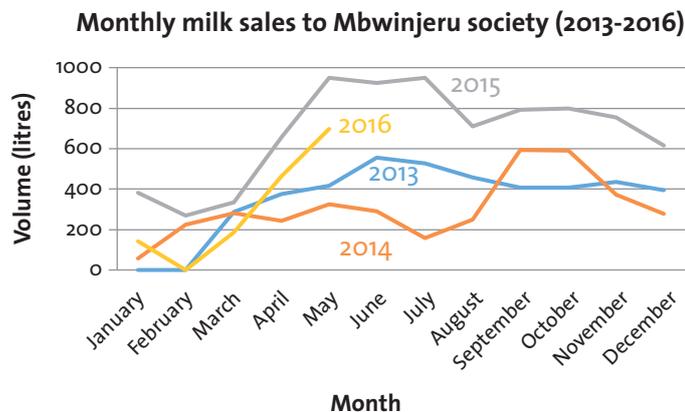
### Taking the learning on board

Mr Rimberia says that he felt very inspired and eager to further invest in his farm after coming back from Mawingu PDTC.

*‘SNV sponsored me for training in Mawingu PDTC and when I came back is when I started improving my farm. I learned a lot in one week. I came back and I continued improving everything – housing, feeding, fodder management, and most importantly records. I increased the volume of silage and to date I have 30 tonnes. I also learned about management in general, i.e. the importance of hygiene, structures, ventilation, and water.’*

To date, Mr Rimberia has clearly improved his feeding practices. Even though he owns only two acres of land, he has already planted approximately one and a half acres of maize for silage. Bidii Dairy Promotors group, the service provider’s enterprise (SPE) in Mbwinjeru (learn more about them in the chapter on ‘Youthful energy’), came several times to make good quality silage without wastage. He now practices crop rotation. In the last season he harvested yellow maize and has now planted French beans on the same plot, because the beans are legumes and fix nitrogen in the soil. He plans to plant yellow maize again once the beans are harvested. The other half of an acre of land is under Napier and Rhodes grass intercropped with sweet potato vines, calliandra, and other grasses.

The training sessions have also supported Mr Rimberia in implementing good calf rearing. The lead farmers received a weighing band from KMDP to monitor the growth of their calves in 2015. Ever since, Mr Rimberia has been using the band to weigh his young stock on the 17th of every month, as a way of analysing the data to enable him to make informed decisions. He has made a graph in his book to view the growth trend. Lastly, Mr Rimberia has invested a lot in improving the cows’ wellbeing. He improved the zero-grazing unit and the cow shed and made sure that hygiene levels were maintained at all times.



**N.B.** The data from Kiambaa society show a gradual increase in milk supply.

Mr Rimberia puts the transformation in his milk production down to his improved feeding practices. He recounted that his milk production from his eight cows used to be 300 litres in March 2015. This volume increased up to 900 litres by the end of 2015. His milk income almost tripled from Ksh 12,654 in March 2015 to Ksh 33,485 in September 2015. He explained that he was able to save Ksh 100,000 within a period of five months, which he used to improve and expand the cow shed. His new shed comfortably holds his eight cows.

### Future plans

Mr Rimberia is confident about his future plans for his dairy farm. He wants to improve his stock to achieve a production level of 20 litres of milk per cow per day. He has already bought his first heifer from a breed that is superior to his other cows. He also plans to expand his fodder storage. In general, he feels comfortable about the volume of feed he is producing right now. He explains:

'I don't lease land because I can manage to feed the cows from what I produce on the farm. I plant every time and that offers me what I need for my cows. My vision is that by 2017, I will have only maize as source of energy for the cows instead of having to buy other forage crops'



Mr Rimberia shows the intercropping of grasses and high-protein fodder.



Mr Rimberia proudly shows his calves and calf pens.



## NEW ENTRANTS TO DAIRY FARMING

For decades, keeping cows for meat or milk was an occupation dominated by men, often above 55 years of age (the 'wazee'). Dairy farming was characterized by traditional methods, with little commercialisation or innovation. However, with increasing demands for milk and dairy products by a growing population and expanding middle class, combined with the development of dairy cooperatives and investment by milk processors, smallholder dairy farmers are increasingly adopting modern ways of farming.

Dairy farming is now promoted as 'a business' and 'a means of becoming rich'. This appeals to young people who show increasing interest in dairy farming. At the same time socio-cultural changes in communities and high levels of participation of girls in education have increased prospects for women to participate in business in general and farming in particular. More and more dairy operations are run by women who equally benefit from the proceeds. KMDP realizes that affirmative action is key to overcoming the barriers that women and young people face.

To better understand the context and the impact of these trends, the stories of three young farmers and the role of women in a dairy farm household are presented here. Joseph (38 years) from Central region, Samson (35 years) from the North Rift region and Benson (27 years) from the Eastern region share their reasons for getting into dairy farming. They tell what the dairy enterprise has brought them so far and how they see the future. The fourth case shows how women in Meru County are trying to move to the forefront and how traditional standards and values are slowly changing.

# Inspired to change

The story of a young couple starting dairy farming in Uruku, Eastern region



The Bensons.

One of the younger farmers in Uruku Dairy Society is Mr Benson. Mr Benson lives with his family (a wife and a four-year old daughter) in Uruku, approximately 20 kilometres south of Meru town. One year ago, Mr Benson and his wife agreed to start paying more attention to their dairy farm. The young farmer has half an acre of land and has two cows. The story of Benson and his wife shows what it is that currently motivates young farmers to invest in dairy farming and how they are managing their enterprise in a sector that mainly consists of older people.



Benson constructed the cow shed with the help of a friend in 2015.

### From side line to main goal

Aged 27 and 26 years, Benson and his wife form the youngest farm household supplying milk to the Uruku Dairy Society. This story starts in 2009, when the Bensons married and moved to a small house. The couple kept three cows on a nearby plot and used the sales of milk as a source of income. Benson remembers the three cows together were producing on average ten litres of milk per day. Compared to the costs involved, the income from milk was not sufficient to sustain the family. This made the couple change its mind. They sold the cows to pay for an electrician's certificate course for Benson, which he successfully completed. At the time, his wife was already working as an accountant at the Uruku Dairy Society, one of the societies that have been supported by KMDP since 2013. At the dairy society she heard about the extension activities for farmers. In 2013 and 2014 she also observed that farmers who attended the training programmes told impressive stories about what they had learned and seen on other farms. These farmers were also making changes to their own farms and were starting to bring more milk to the Uruku Dairy Society. She noticed that the extension activities had stimulated better milk production and farmers were earning higher incomes from milk sales. She became inspired and convinced her husband to join the society's extension programme. Since then, the young couple has been attending training and exchange visits organized through KMDP. The exchange visits in particular made them decide to re-invest in their dairy farm and to buy their first cow early 2014.

*'The tours, that's what inspired us to start dairy farming [again]. We could see ourselves reaching the levels we had heard from other farmers in their stories.'*

### Eager to invest in learning

After Benson and his wife had decided to re-start the dairy farming, they began attending route training sessions and more exchange visits. Their initial aim was to find answers to their two main questions: where should they keep their cows and what should they feed them. The couple had already experienced these challenges in 2009. Benson explained that these two major constraints are widespread among farmers of his age that want to invest in dairy. As for him, he was also uncertain about how to keep his herd healthy. This was because in the past, they had lost two calves to disease and delayed treatment.

The training sessions made the young farmers aware of taking cow comfort, sufficient feed, and herd health management into account. Their first practical step was to buy cows. Benson applied for loans from Uruku's Savings and Credit Cooperative Organization (SACCO) through his wife's account. They used the money to buy their first cow in February 2015 and a second cow some months after that. When the case study was completed, the first cow had calved down and the second cow was expected to calve down a few months later.



Investments in calf rearing: a calf pen and vaccinations.



Mr Rimberia shows the intercropping of grasses and high-protein fodder.

During the extension activities Benson had learned the importance of positioning the cow shed in a place where he could observe the cows easily both during the day and at night. With the little money that he had saved from his casual jobs as an electrician, Benson bought the materials to build a cow shed, a calf pen, and a feed store, and constructed them only a few metres away from his house. Benson and a close friend of the family built the buildings albeit without technical plans. Although the cows have shelter, the buildings need to be improved to increase cow comfort. In terms of feed, the exchange visits convinced the Bensons to plant maize for silage instead of for human consumption. On a quarter-acre plot, the Bensons planted maize for silage in the second season of 2015. With help of Uruku's extension officer, they harvested and managed to preserve two tonnes of silage in January 2016. In the following season, Benson established yet another crop of maize and made a second bunker of silage. After one of the exchange visits that took place in early 2016, Benson replaced a small part of his maize with sorghum. This was a trial as he had learnt that sorghum would be more drought resistant in case of irregular rainfall. Benson also buys hay, uses Napier grass, and in the future he plans to establish high-protein fodder crops. Next to buildings and feed, the Bensons became aware of good young stock health care and management. During one of the training sessions given by KMDP's consultant, the farmers were advised to vaccinate their cows to protect them against diseases, which they did as instructed. Benson's wife states that they both understand that it would be cheaper for them to take preventive measures than to spend more money on treating the animals.



Benson and his daughter in front of the maize that is going to be ensiled.

### Reaping the rewards

The upcoming service delivery system from the Uruku Dairy Society is helping the Bensons to make a living from their dairy farm, even though they own a small plot. The Bensons have said that the income from their current dairy farm gives them a more reliable livelihood compared to what they had before. The records show the Bensons have a morning milk production of eight or nine litres from the one lactating cow at the time of this documentation. This production is supported by feeding maize silage as the main forage source at the time. Benson admits that without silage the cow would produce only six or seven litres of milk, which is two or three litres less per milking time. The Bensons currently receive a stable daily income as the Uruku society is paying Ksh 35 per litre of milk

supplied. The family supplements its income with the wife's earnings as an accountant at the cooperative society. However, they both agree that their future is in the family's dairy enterprise and they will carry on investing in dairy to make the returns sufficient to meet their needs.

### The dairy dream

The Bensons intend to expand the dairy farm up to five milking cows in the short term and to buy a larger piece of land where they can support a herd of 50 cows in the long term. Benson's wife hopes that one day the dairy enterprise will be profitable enough for her to shift from her current job at the society to become a full-time dairy farmer. However, the young couple also admits that they need to increase their skill level by participating in more extension activities, to prepare themselves for the increasing herd. The Bensons have already improved the feed quantity at their farm and they now aim to preserve at least ten tonnes of silage later this year by leasing land from relatives. They both understand that with the plan of growing their herd, they will also need to expand the other systems: the cow shed, fodder production, and management skills among others.

The Bensons are happily married and attend the dairy training sessions together. This collaboration helps them to consult and make decisions about the dairy farm jointly. They are of the view that for young farmers to prosper in dairy, they need to attend training and set up their dairy farm as a business instead of seeing it as a source of milk for household consumption only. Benson suggests that one major drawback to farmers of his generation is that they have not inherited profitable dairy farming practices from their parents. Instead, they have seen a generation of farmers impoverished through failed agricultural enterprises. This makes young investors hesitant to invest in dairy and other rural agricultural enterprises in general. The young people who might be interested in investing in dairy farming often

Date	Cow Name: LONANDE			Cow Name: [unclear]		
	AM	PM	TOTAL	AM	PM	TOTAL
1	7.5	5	12.5	7.3	4	11.3
2	9	4	13	8	4.5	12.5
3	8.5	4.5	13	9	5	14
4	8	5	13.5	9	4.5	13.5
5	9	5	14	9.5	5	14.5
6	7	5	12	7.5	4.5	12
7	8.5	4.5	13	8.5	5	13.5
8	7.5	6	13.5	6.5	4	10.5
9	7	5.5	12.5	8	5.5	13.5
10	7	4.5	11.5	7	4.5	11.5
11	8.5	4.5	13	9.5	4	13.5
12	9	4	13	8.5	5	13.5
13	7	5	12	8	5	13
14	8	4	12	8	4.5	12.5
15	9	5	14	9	4	13
16	9.5	4	13.5	7.5	4.5	12
17	7.5	5	12.5	8	5	13
18	8	3	11	8.5	4.5	13
19	4	4	8			
20	9	5	14			
21	8	0	8			
22	8	5	13			
23	9	5	14			
24	8	6	14			
25	9	4	13			
26	8.5	5	13.5			
27	7.5	4.5	12			
28	8.5	5	13.5			
29	8.5	4.5	13			
30	9	5	14			
31	8.5	3.5	12			

The records of the two cows in March and April 2016, when both were producing milk.

lack land, as their parents hang on to their ancestral land themselves. Apart from those who are able to purchase land elsewhere, young people face difficulties in engaging in commercially viable dairy farming. That is the reason, Benson argues, that the majority of them see a more promising future in being employed by the government. The Bensons hope to see more involvement from the extension staff and management of the Uruku Dairy Society in the near future. They can encourage young people to invest in dairy farming by organizing meetings and training sessions that focus on information exchange between such potential farmers and existing progressive dairy farmers. Benson remarked that interest in dairy farming is growing among his peers, especially when he shares his story with them. His peers now see the possibility of earning a higher income from milk as they develop into modern dairy farmers. They also derive fulfilment from owning the enterprise and that every value achieved in the enterprise is theirs. According to Benson’s wife, this appeals to many of their peers.

***‘With those [extension] meetings, especially for younger farmers, we can call them to join the meeting and they can become motivated to join dairy farming. When they understand better, they will join.’***

# Making a smallholding more viable

The story of a young smallholder in Kinangop, Central region



Mr Joseph Wakibugu.

Joseph Wakibugu owns a four-acre farm in Kinangop, approximately 40 kilometres east of Naivasha town. Aged 35, Joseph is one of the youngest dairy farmers supplying milk to the Muki Dairy Society. At the time this report was written, Joseph had 14 cows, of which seven were lactating, three were heifers and four were calves. Joseph's story demonstrates how a young farmer has learned to invest in his farm, it describes the challenges he has encountered over time and how other young people have responded to his work.



The feeding place for the calves.

### Taking over the dairy farm

Joseph grew up in Kinangop, South Nyandarua sub-county. The area is popular for both crop cultivation and dairy farming. Joseph attributes his interest in dairy farming to his father, who was already into dairy farming when he was a boy. The young farmer remembers that his father 'paid food, school fees, and farm labourers from milk income only'. This was also Joseph's ambition. He wanted to be able to take care of his wife and two children. After completing his primary education in 2000, Joseph started helping his father on the family dairy farm. When his father stopped his dairy farming activities in 2006, Joseph took over the four acres of land, which is double the size of an average farm in the area. He also took over his father's two cows. Joseph had already tried his hand at horticulture and other private business ventures. However, although he had not kept any written records, he observed that his dairy enterprise was doing better than his other businesses, so he opted to focus on dairy.

### Open to new ideas

As a member of the Muki Dairy Society, Joseph had already heard about the opportunity to participate in monthly training sessions at milk collection points. Even though the Muki Dairy Society had employed extension officers before, the intensity and scope of extension activities improved when KMDP started providing technical support. The training sessions with farmers from a milk collection point



One of the exchange visits inspired Joseph to build his own calf pen.

are now organized by the extension officer in conjunction with a KMDP consultant. Other sessions are organized in collaboration with the dairy society with input from suppliers, through field days, or as exchange visits between progressive farmers and other smallholders.

After attending the first series of training sessions organized by the society in 2013, Joseph markedly improved the general management of his dairy farm. He applied for a loan from Muki's Savings and Credit Cooperative Organization (SACCO) to expand his herd. Based on lessons learned during the exchange visits, he constructed a calf pen and paddocked land for his calves. The exchange visits also exposed him to the concept of cultivating maize for silage. This convinced him to make his first silage in 2013.

Joseph took a break from dairy farming in 2014, because the government had permitted him and other farmers to use some land near the forest to plant potatoes. After harvesting the potatoes, he evaluated his incomes and preferred the regular income from the dairy enterprise, rather than the income from potatoes that he received only twice a year. It became very clear that he would then focus entirely on his dairy enterprise. The fact that Joseph's attention was diverted from dairy is typical for young people, who tend to try many ideas, before they later learn to focus. In 2015, Joseph attended more training events organized by the Muki Dairy Society. He decided to use the land he had used to grow potatoes to grow feed for his cows instead. Within a few months, he was harvesting high-protein fodder crops such as purple vetch, lucerne, sweet potato vines, and oats. He also constructed a hay shed

in readiness to store feed once harvested. He anticipated that, once he had filled the hay store, it would feed all his seven milking cows for at least six months. The hay shed also had maize stover as a last resort in case of drought in the region.

### Innovation leads to independence

Looking back, Joseph does not regret settling for the dairy enterprise, because it gives him a good income. His children are in private schools and Joseph has had no problems paying their school fees. He also attributes his progress, especially in milk production, to the assistance he got through loans obtained from the Muki SACCO. Joseph received a loan from the SACCO amounting to Ksh 50,000 and is eligible for higher amounts as long as it is justified by need and co-guarantors.

Joseph has noticed that some of his peers, who went to town to search for jobs, are now returning to the villages to go back to dairy farming and other agricultural enterprises. They see Joseph as a good example, especially because his dairy farm has been profitable and, even more exciting, he is 'his own boss' and controls the operations of his enterprise. Joseph thinks that young farmers are more capable of developing the dairy sector, because young people are known for being more innovative as compared to their older counterparts.



The zero-grazing unit houses ten cows.

*'Young farmers are more energetic and innovative. For example, I constructed the cow shed myself, once I realized most masons could not understand the dimensions of the cow shed that I wanted. My cow shed was the first in this area and later the masons came to learn from me.'*

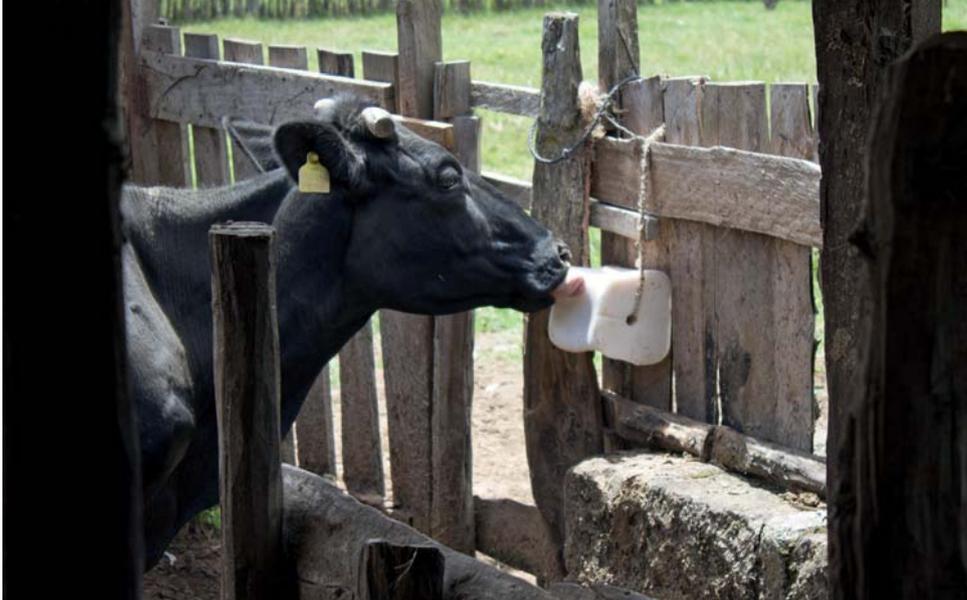
Joseph suggests that Muki Dairy Society has a key role in attracting more youngsters into dairy farming and in helping progressive farmers in general. The dairy society should promote dairy farming by showing young farmers 'modern ways' of farming and make them aware of the opportunities that dairy presents.

### Addressing future challenges and possibilities

Joseph sees a promising future in dairy farming and he plans to continue investing in it. In the short term, he plans to produce 140 litres per day from his seven milking cows. However, he first needs to overcome his current operational challenges. He picked out calf rearing and young stock management as the areas he would like more coaching on. He plans to improve his calf pen to protect his calves against extreme weather conditions such as low temperatures and rain, but also to enhance their feeding. He thinks that his poor calf rearing is the reason that his heifers take a long time before coming into heat. Joseph also plans to increase his silage to make sure he has sufficient feed for his herd. Another issue that Joseph plans to work on is record management. So far, he has not maintained good records, yet he understands the essence of good record management as a way of determining whether he is running a profitable enterprise or not.



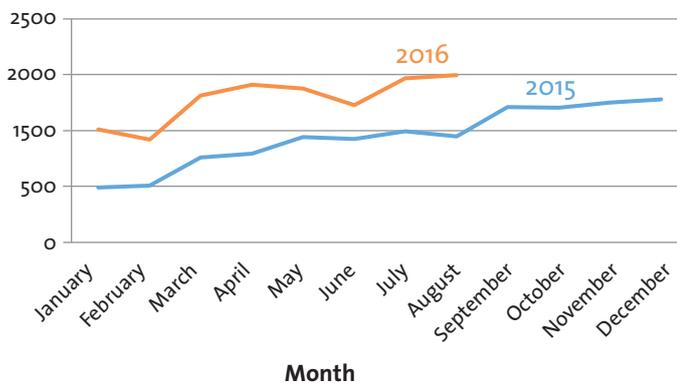
The hay barn is ready to store purple vetch, lucerne, sweet potato vines and oats.



Training sessions on the importance of feeding led Joseph to buy a mineral block.

A key constraint that Joseph still faces is in accessing equipment for fodder harvesting. He observed that machines are in limited circulation and in some cases completely unavailable. In other cases, contractors are overpricing. This makes it difficult for farmers to adhere to best practices in terms of timely and optimal fodder harvesting. He suggests that Muki as a dairy society could help many progressive farmers if it would start leasing out machinery - especially for harvesting and silage-making.

**Monthly milk sales to the Muki Dairy Society (2015-2016)**



# From living on the streets to making a living on a farm

The story of a street urchin becoming a young farmer in Ainabkoi, North Rift Region



Mr Samson Kipchumba.

One of the young farmers supported under KMDP is Samson Kipchumba, a member of the Ainabkoi Dairy Society based in Uashin Gishu County. The Ainabkoi Dairy Society is a dairy cooperative located approximately 70 kilometres southeast of Eldoret and 12 kilometres off the Eldoret-Nakuru highway. Mr Kipchumba is an example of a down-but-not-out city youngster who discovered and exploited the opportunities offered by dairy farming. Within seven years he has been able to grow his herd from one to eight cows by adopting the good practices of total dairy farm management. He is now able to take care of his family.



Samson replaced his donkeys with cows.

### Starting from scratch

Samson Kipchumba, aged 38, is currently one of the youngest farmers in the Ainabkoi Dairy Society. When Samson was a tender age, his parents separated and his mother remarried. Samson was sent to live with his grandmother. He completed primary school and started doing menial jobs to earn money to pay for his own high school fees. After completing his secondary education, Samson moved to the town of Eldoret to search for a job. It was not long before he ended up living on the streets. There were no jobs available and he could not afford to pay rent. Even though he lived on the streets of Eldoret, Samson found menial jobs doing manual labour, such as cleaning the market or carrying luggage.

This situation changed in 2006 when he found a job as a donkey rider. After one year he had saved enough to buy one donkey and started his own donkey transport business. In 2007 his father gave him a ten-acre piece of land. Samson returned, together with his donkey, to his village 'Ainabkoi'. He built a house there where he has been living ever since. Samson continued with his (donkey) transport business, but in 2009 he decided to sell a colt for Ksh 7,000 and used this money to buy a cow at a cattle auction. He had his cow inseminated and was blessed with two female calves. He remembers that his cow was soon producing around eight litres of milk per day. He used four litres for his family and sold the other four litres to the Ainabkoi Dairy Society.



The donkey transport business gave Samson the opportunity to invest in his dairy farm.

### Growing even further

When he started his dairy farm in 2009, Samson was not only one of the youngest farmers in the Society, but also had one of the lowest milk production levels. Samson had the ambition to increase his herd size and to increase his milk production. However, his only sources of expertise were neighbouring farmers, because the society had not employed an extension officer yet.

Since 2013, KMDP has been working with the Ainabkoi Dairy Society to improve training and extension services to its members. KMDP signed an agreement of collaboration with Ainabkoi Dairy Society and deployed a dairy consultant to support the Society in establishing a training and extension unit. The consultant and the newly employed extension officer started to organize farmer training on good dairy farm practices in some of the key areas of operation, such as feeding, breeding, fodder management, and record keeping.

*'KMDP's consultant was instrumental in changing my mind set on dairy farming. He advised me to use high quality semen from Coopers, which I did. The result was clear as the calves grew much faster than I had seen before. Now I use sexed semen from Coopers and I am also lucky that for quite some time, I have had only one bull in a couple of births.'*

Samson has been attending training sessions offered by input suppliers and organized by the cooperative society. He remembers that he attended his first training session in 2013, where he learnt about the importance of feeding. He learnt about adding minerals to the rations and about establishing his own high-energy and high-protein fodder crops. These training sessions triggered Samson to establish an acre of maize specifically for silage. Later, in 2013, he conserved silage for the first time. He also attended two exchange visits to Eldoret; one at Willens Farm and the other at Kapsuswa Farm. As a result of the exposure visits, he improved record keeping, milk hygiene, and feeding practices as well as breeding practices. In 2015 he joined yet another exchange visit, to Ed Farm in Eldama Ravine. It was during this visit that he learnt about proper management of Napier grass. He planted half an acre of Napier grass that he has been harvesting twice a year since.

### The current situation

The training sessions have assisted Samson to expand his herd size. He currently has eight cows, three of which are lactating, one is dry, two are heifers, and two are calves. The three cows produce a total of 41 litres of milk per day. Samson sells the milk to the Ainabkoi Dairy Society and from the income he is able to pay school fees for his two children to attend private schools; the fees amount to Ksh 12,000 per term. Samson has already made other investments. He purchased a water pump to get water onto his farm. He is also in the process of building a new cow shed that offers space for all his stock. He set aside two acres of land and paddocked it for daytime



Inspired by other farmers, Samson is now constructing a cow shed.



Samson has been making silage since 2013.

grazing of his cows. He applied for a loan of Ksh 40,000 from the Savings and Credit Cooperative (SACCO) affiliated to the Ainabkoi Dairy Society and used this loan to purchase a second-hand motorbike for two main reasons: to take his children to school and to transport dairy feed from the dairy society's agro-vet shop to his farm. He applied for yet another loan of Ksh 36,000 from the same SACCO, which he used to buy a silage chopper. He is still using his

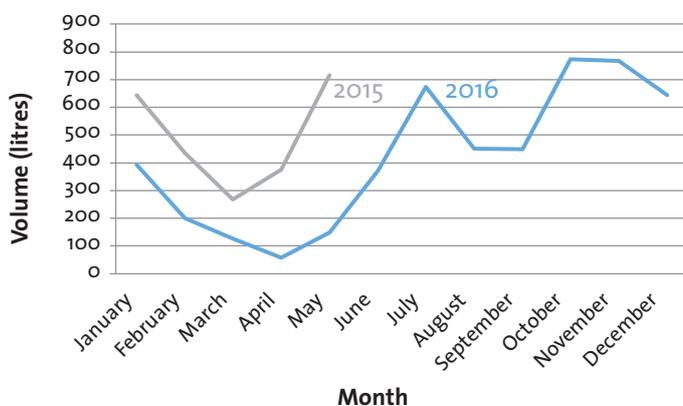
donkeys to transport water and forage for the cows from the fields to the cow shed. Samson leases extra land from his father and uses this land to plant maize for silage. He then pays his father through his account at the society: every day, two litres of milk are deducted from his supply and added to his father's account as a way of settling payments with his father.

### Future plans

Samson hopes to increase his herd size to up to 40 cows and to improve his dairy management practices to match this herd size. In order to do this properly he needs to master proper breeding, especially in sourcing high quality semen. The Ainabkoi Dairy Society does not stock or supply semen, so farmers depend solely on private inseminators. However, the quality of the services provided by the private inseminators is not consistent and sexed semen is expensive: a single service costs between Ksh 4,500 and Ksh 15,000.

Samson realizes that he also needs to plant more fodder on his farm to match his herd size. In order to make this possible, he is in the process reclaiming a piece of land that will help him to plant sufficient fodder in the (near) future.

**Monthly milk sales to Ainabkoi dairy society (2015-2016)**





Paddocking the grassland helps to manage the feeding of grazing cows.

# It's a man's world... isn't it?

The role of women in dairy farming in Kithirune and Uruku, Meru region



Gender equity.

KMDP commissioned a scan into gender roles in the Meru region of Kenya to inform the development of more effective interventions in the dairy sector. The programme wanted to know to what extent gender equity issues influenced the supply chain of two dairy farmers' cooperative societies it is working with. How do women and men perceive their roles on their dairy farms in the Meru region of Kenya, especially as smallholder dairy farmers are taking up dairy farming as a business? Are the traditional roles being followed as a matter of course? Or are women playing a more active role in the business of farming than previously was thought?



Women in Mumberes delivering milk to the milk collection point.

### The research areas

The scan was done in early 2016 as a survey among 140 participants of whom 70 percent were women and 30 percent men. It analysed the role of women in two dairy societies that are supported by KMDP, i.e. the Kithirune and Uruku Dairy Societies. Both societies are located in the Imenti constituency of Meru County and are affiliates of Meru Central Dairy Farmers Cooperative Union. The Kithirune Dairy Society is located approximately 15 kilometres southwest of Meru town, while the Uruku Dairy Society is located another five kilometres further south of Kithirune. The scan focused on the four main aspects of gender equity: participation in decision making in farm operations; access to productive resources; access and control over the use of income from farming; and leadership and representation.

### The role of customs and traditions

The people in Meru region have many customs and traditions. Amongst them are that property law and tradition both favour males. It is customary that men own the land and cows and that women move to their husband's home when they get married. If the husband passes away at a young age, his wife is left to manage the land and livestock as steward, waiting for her sons to reach adulthood so that they can take over. In a worst case scenario, the woman is abandoned and the husband's property and belongings go to his brothers and cousins.

It should be no surprise to learn that for a long time men have dominated leadership

in the cooperative dairy societies. This situation is influenced by the fact that men own both the cows and the land. Women are allowed to use the land for the cultivation of food crops that are used primarily to feed the family, but if men cultivate the land it is to raise cash crops such as tea. Men also decide whether or not to share the proceeds from dairy farming with their wives.

### **Does he run the place... or does he just think he runs the place?**

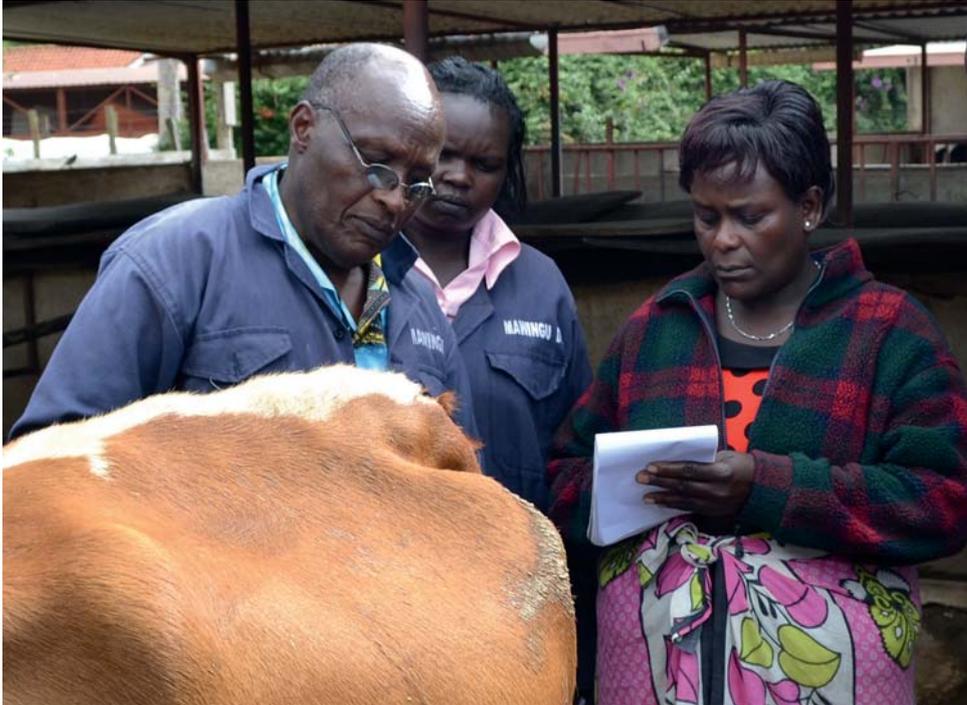
The scan looked into women's influence on decision-making on farm production activities over the previous twelve months. For example, how many cows to keep, how to use the available land and whether to buy (or to lease) land and equipment. All 140 participants in the study reported that they were somehow involved in these dairy farming activities, but the perceived level of involvement differed in both groups. Fifty-seven percent of the female participants reported that they were 'sometimes' involved and 24 percent of them reported that they were 'mostly' involved.

All participants reported to have been involved in deciding what the incomes generated from dairy farming would be spent on. The respondents said the main decisions – such as the buying or selling of livestock or land, or paying school fees – were made jointly by the man and the woman. Regarding other decisions, more than half of the female participants and half of the male participants reported to have been 'sometimes involved'. Twenty-four percent of the women and 35 percent of their male counterparts reported to have been 'mostly' involved. Almost the same percentages applied to their male counterparts, though relatively speaking, more women were 'sometimes involved' and more men than women were 'mostly involved' in decisions regarding income and expenditures.

### **So how does that affect development opportunities?**

The study also looked at the extent to which gender plays a role in the involvement in extension activities. Agricultural extension is an informal educational process, whereby farmers receive training that should help them improve the production in their farms. Both the Kithirune and Uruku Dairy Societies offer extension activities, and all study respondents reported to have had access to those services. Almost half of the participants reported to have participated in extension activities with male participants attending slightly more often than their female counterparts. The study also revealed that women interact more with service providers, because they are the ones who stay at home and take care of the animals.

NGO's and dairy sector players such as the Meru Central Dairy Farmers Cooperative Union organize gender awareness meetings for members of dairy societies, as gender awareness information can help farmers to understand the role of women in the dairy enterprise and the place of gender equity in their society. The survey shows that almost half of all the respondents attended gender awareness meetings. Seventy percent of the male participants reported to have attended such forums as compared to 42 percent of their female counterparts.



Women attending a training day at Mawingu PDTC.

### Who owns what?

As mentioned earlier, in the traditional settings of the Meru community, men owned the key farm assets such as land and the cows. Money earned from milk production was mostly spent after joint decision-making between man and wife. The study showed that while 90 percent of the male participants reported that their spouses collected the milk income, only 30 percent of female participants agreed with that. Sixty percent of them say that it is their husbands who collect the money from milk. However, banking records at the Kithirune Dairy Society show that the milk payment is transferred to accounts owned by women in 37 percent of cases (where 43 percent of the 484 society's members at the time were female) while 62 percent of the accounts in Uruku are owned by women (where 35 percent of the 833 society's members at the time were female). Just as the figures on who collects the income from milk, the figures relating to who collects money from the sale of cows are equally controversial.

Almost all male participants reported that they owned the land and this was confirmed by the majority of the women. A small percentage reported that land ownership was shared between the man and the woman, and a few female participants said they owned the land because their husbands had died. Ownership of livestock other than cows and household assets was mostly shared between men and women.

### Who has the last say?

The majority (76 percent) of the participants reported that decisions about when assets, such as small livestock, farm equipment and consumer durables, should be sold were made jointly with their spouse. Eighty-two percent of men and 73 percent of women reported this respectively. This also includes the decision to mortgage or rent out the assets: 82 percent of the respondents said they make this decision jointly. Almost half of the male and female participants indicated that decisions about the purchase of a new item for the household were made jointly. The other half of the participants stated that the spouse made the decision, while only a few individuals declared that they made the decision by themselves.

### How does succession work?

Succession at the household level happens after a divorce, separation, or death of a spouse or partner. In the past, succession rights were unambiguous. When the husband died, the woman received minimal ownership over assets. On the other hand, when the wife died, the husband inherited all the assets. The survey indicates that most of the participants now say they would share their property if there were a separation or divorce. Half of the men say that the ownership would go to their wife while 25 percent of the women state that the husband would take over all property. In the event of a death, 80 percent of the participants say that ownership would go to their spouse. Only 13 percent of them say that the ownership would go to the spouse and others (e.g. other household members).



Feed is stored above the cow shed.



Martha Kibia uses her farm in Ndumberi to demonstrate intercropped desmodium .

### Do women have influence on financial decisions?

Most dairy societies are affiliated to a Savings and Credit Cooperative Organization (SACCO). These SACCOs provide their members with an opportunity to access credit based on milk volumes delivered. The maximum amount they are eligible to lend is equivalent to three times the amount of the (three-month) income from their milk. The borrowing member is however required to be guaranteed by three other members of the society for purposes of loan security. The study shows that slightly more than half of the participants (half men and half

women) had access to credit. Seventy-five percent of males and 30 percent of female participants reported to have made the decision to borrow money jointly. Half of the latter indicated that it was the husband who made the decision unilaterally, while only 15 percent of them said that it was their decision solely. However, the majority of the participants stated that the decision about what to spend the loan on was made jointly. Seventy-five percent of the men and 80 percent of the women confirm this.

### Do women play a role in leadership outside the home?

Although men are still perceived to be the head of the household, the number of women in Kenya taking up leadership positions in the community has been increasing steadily. This trend has been developing as more and more women lead their own meetings in church groups or merry-go-round groups where they set their own agenda and successfully implement it. The fact that women are succeeding in women-led groups is also influencing their role in mixed community forums. They are becoming more assertive and grow bold enough to make independent contributions in social and community meetings. However, these numbers are still considered to be low.

KMDP encourages women to present themselves for elections in the dairy society. Though the study shows that women have the capacity to take such roles, as evidenced in the way they lead in other circles such as church groups, few women are elected. Notably, they lose elections due to lack of support from men, who form



Susan Murithi with her young stock in an improved calf pen.

the majority in terms of members in cooperative societies. Kithirune's management board consists solely of male members, while Uruku has two female members out of a total of seven leaders.

### **Do women have alternative work opportunities?**

Besides dairy farming, the survey shows that women are also involved in other income generating activities. Women say to generate some income from the selling of vegetables and fruits on the market and to neighbours. Another source of income comes from employment. 75 percent and 66 percent of the men and women respectively reported to have opportunities to work outside the farm, such as casual labourers.

### **Conclusion**

This study reveals that dairy farming in Kenya is not exclusively a man's world. The emphasis on the main factors of gender equity (female representation in dairy production; women's access and control over resources; women's share in the income generated through dairy farming; and women's participation and leadership) show that in three out of four areas women have an increased role in the decision-making.

The number of women represented as a member in the two cooperatives is less than 50 percent, but shows that dairy farming no longer has an overwhelming male bias. The study does reveal that the main resource for agriculture production, land, is still largely held by the man of the household. On the buying, selling, renting, and sharing of other assets, the male and female respondents both express joint decision-making processes. The third factor shows that women increasingly have a say in income generated from dairy farming, most often through joint decision-making. Female respondents confirm that they have access to dairy incomes and are able to make decisions jointly with their spouse on the use of the proceeds from dairy (consumables and school fees) on investments in the dairy enterprise. At the same time, the availability of non-farm employment shows that the women engaged in dairy do it out of choice rather than out of necessity. Most women also have access to credit and saving mechanisms. It can be concluded that looking through the income lens, female respondents are generally empowered and are able to participate in equitable decision-making at the household level.

Although gender roles are more equitable in dairy farming, women are generally under-represented in formal organizations and representative bodies, which is mainly related to socio-cultural factors. In this respect you can say there is gender inequity, but this is not related to women having less skills, lacking the ambition to lead, or being less educated than men.

This survey has brought an insight into interesting developments in gender equity issues relating to dairy farming. However, it should be noted that the scan did not reveal any contextual information or explanation as to when and why women might have little input or a larger input, nor does it explain why women are either sometimes involved or mostly involved in decision-making. Neither does the survey show the deeper impact of the changing role of women. Even though they participate more often in decision-making in the household, the extent of the practical consequences of this, is not known. It will take more participatory research to determine and understand these dynamics.



Lead farmer Margaret Riungu training farmers from Nanyuki on feeds and feeding.



## FEED, FEED, FEED

Limited land for growing fodder crops on-farm, lack of knowledge of suitable fodder crops, low skills in preserving fodder, and low quality of commercial hay: these are amongst the many reasons why milk volumes of smallholder dairy farmers are low and fluctuate with the seasons. Productivity per animal is low and the cost price of raw milk is high. To overcome this challenge, dairy farmers need to know what crops do well in their area and yield good energy and protein- rich fodder. They need to learn how to grow and preserve these and how to feed them to their cows. Alternative means of access to quality fodder, for example through communal leasing of land, contracting service providers for making silage, or using commercial fodder supply chains are necessary in case on-farm fodder production and preservation are problematic due to lack of land, skills, or labour. With (smallholder) dairy farmers adopting these new practices, the demand for (new) services is growing.

The four stories in this section show how KMDP approaches the ‘fodder gap’ by seeking to promote and support market-based solutions, respecting both farmer and business angles. Two of the stories show the ‘fodder challenge’ from the perspective of the smallholder. Mr Justus from Eastern region and Mr Jackson from North Rift region share their own way of dealing with it; revealing that while overcoming one challenge, they experience others. The other two stories show the perspective from upcoming enterprises, namely Bidii Service Providers Enterprise, which is specialized in making silage, and commercial fodder producer ‘Mburu Gichua’ farm, which grows grass, preserves it as hay, and sells it later. These stories illustrate the increasing farmer demand for fodder and how entrepreneurs are able to respond to these needs.

# Eager to promote learning

The story of a farmer establishing a fodder demonstration plot in Kithirune, Meru



Mr Justus Mutuma.

Mr Justus Mutuma is a farmer from Kithirune, an agricultural area some 20 kilometres southeast of Meru town. He lives on a three-acre farm and has nine cows. At the time of writing, four cows were lactating, producing about 800 litres of milk per month. Mr Mutuma realized that the feeding practices of farmers in Kithirune, who mostly fed their animals with grasses, were insufficient for their cows. He decided to invest in fodder trial plots, grow different crops, and then share his experience with other farmers. This story shows how Mr Mutuma established and managed the plots, points out the challenges he encountered and how he has benefited from the results so far.



Mr Mutuma not only plants yellow maize and lucerne, he also grows Napier and Rhodes grass.

### Getting help

Mr Mutuma is in his 50s and lives with his family on a three-acre farm. Being a life-long farmer, he used to grow potatoes, but switched to dairy farming in 2011. He started off with three cows and gradually grew his herd to nine. When Mr Mutuma started dairy farming, he visited the Timau area, where he learnt about Napier and Rhodes grasses and good feeding practices. However, his lack of knowledge about high-protein forages and fodder preservation methods made his milk production fluctuate during the dry season. He wanted to realize a stable, year-round milk production by establishing and preserving sufficient fodder on his farm.

He became the chairman of Kithirune dairy society in 2013, just before KMDP started to provide technical assistance to the Society. Kithirune started taking over the organization of training sessions and exchange visits by Kithirune's newly employed extension officer in collaboration with KMDP dairy consultants. Mr Mutuma became active in attending these activities. As the society chairman, he had a strong desire to lead the society by example. He implemented what he had learned in the training, and constructed a zero-grazing unit, a calf pen, and a feed store; he also planted several types of fodder crops (see box).

### The introduction of new fodder types

During follow-up visits, KMDP consultants and Kithirune's extension officer suggested that he could set up demonstration plots as part of enhanced learning for him and others. The aim was to show farmers a number of different fodder crops

### Mr Mutuma's farm

- Proper farm structures
- Zero-grazing unit
- Calf housing
- Cow housing
- Record keeping
- Body conditions of the cows
- Disease management
- Good fodder management, different varieties:
  - 1 acre of yellow maize
  - 0.25 acres Napier grass
  - 0.25 acres Rhodes grass
  - 0.25 acres lucerne
- Feed plan
- Clean milking parlour
- Healthy and clean cows.

in real life. Mr Mutuma and a handful of other farmers were willing to devote their land and time to prepare the demonstration plot, receiving different type of crop seeds. In 2014, Mr Mutuma planted half an acre of yellow maize and six by six metres of lucerne with seed that he had received from KMDP. Lucerne was selected as a temperate perennial legume, capable of producing high quality forage throughout the year. KMDP introduced yellow maize, because it is more nutritious than white maize and is known as 'livestock feed'. It is therefore less likely that farmers will use yellow maize for human consumption.

Most farmers from Kithirune had not seen lucerne before, but had heard about it being a good high-protein fodder. They did not know anything about yellow maize either. Growing and feeding cows with good quality lucerne helps to reduce the cost of expensive concentrate-based proteins. Mr Mutuma received technical support from KMDP consultants and could call them any time he experienced a problem.

Mr Mutuma concluded that his 2014 demonstration plot was successful. Yellow maize was doing well and matured faster than white maize. At maturity, he called the Kithirune's Service Providers Enterprise (SPE) (read more about the SPE model in the case study 'Youthful energy') to silage five tonnes of yellow maize. However, due to the small size of the lucerne plot, it was not possible to measure the actual improvement in milk production due to lucerne feeding.

### The second time around – practice makes perfect

Although the feed trials went well in 2014, farmers had not experienced the impact of high-protein forage. So in 2015, KMDP focussed on up-scaling the high-protein fodder plots to convince farmers that feeding high-protein feeds can increase milk production and reduce feeding costs. Based on his performance in 2014 Mr Mutuma was selected for a second time and he received enough lucerne seeds for a quarter



Mr Mutuma discusses the yellow maize behind him with KMDP's consultant.

acre plot. Two other farmers received lupine seeds.

KMDP provided technical support right from the start. Good lucerne production depends on soil acidity, so before planting, KMDP facilitated soil analysis. They advised the farmers at each stage on fertilization, weed control, harvesting, preservation, feeding, and information on where to source needed products. In spite of that, some of the problems the farmers faced were also new to KMDP advisors. It proved to be a learning experience for all concerned (see box).

The soil analysis showed that significant amounts of lime and fertilizers were needed for lucerne to do well, so Mr Mutuma applied 300 kilograms of lime on his plot. However, after planting he noticed that weeds overtook the crop, even though the plot was weeded at least once every three weeks. He also discovered his crop had leaf rust and had to spray it.

Aside from the lucerne plot, Mr Mutuma also expanded his demonstration plot of yellow maize to one acre in 2015. After four months the plot yielded 20 tonnes of silage. Mr Mutuma also faced challenges with this crop. The root system did not develop well causing the maize plants to fall over. Despite this setback he concluded that the benefits of yellow maize outweighed the disadvantages and he decided to plant yellow maize again in January 2016. This time he observed the crop grain to be more yellow than he expected. There was no simple explanation for this. It could have something to do with varying seed quality as the supply of yellow maize seed is largely informal.



Mr Mutuma discovered leaf rust on the lucerne.

### Putting learning into practice

The training sessions, exchange visits and demonstration plots helped Mr Mutuma to invest in his farm. He enhanced feeding practices by developing a feeding plan and planting different fodder crops: maize, grasses, lucerne, and sweet potato vines. The yellow maize also introduced him to silage-making. The first round resulted in five tonnes of good quality silage; enough to feed his three cows for three months. The second round of 20 tonnes is still in the bunker. Mr Mutuma testified that the silage

#### Lessons learned about growing yellow maize

- Direct seeding, early season, when soil and temperature conditions are favourable
- Delayed planting leads to reduced yields
- Seeds are dropped in furrows / planting holes
- Spacing between plants 75 cm by 30 cm for areas with adequate rainfall (44,000 plants per acre)
- Yellow maize is sensitive to weeds during the first 4-6 weeks after germination; the crop should be weeded twice until it reaches a height of one metre
- In areas with low rainfall, irrigation should be done especially at the time of tasselling and fertilization
- Intercropping can increase the yield
- When leaves start yellowing yellow maize is mature for harvesting
- Yellow maize needs to be stored well to prevent attack by pests and diseases.

prevented a drop in milk production during the dry months of August to October 2015, as shown in the graph. He plans to double the acreage under yellow maize and will try Rhodes grass on a quarter acre, to make sure that he will be able to feed his five milking cows comfortably during the dry season. To ease his work in silage-making, Mr Mutuma invested in a diesel-powered chopping machine. The up-scaled demonstration plot of lucerne proved to be a challenge for Mr Mutuma, because he incurred more costs than he had expected. The nutritional value of the crop had not yet been determined either. However, he solved the weed problem by cutting the lucerne every three to four weeks, then weeding and manuring it further after the cut. He observed that the cows like lucerne and that they increase their milk production after feeding on this high-protein fodder. In the end he was satisfied with the lucerne, especially because he only needed to lime and to sow seed once and the crop continued to grow. The KMDP consultant also evaluated the farmer's encounter with lucerne and concluded that it was still questionable whether the benefits from a higher milk production would outweigh the high costs of liming, land preparation, purchase of fertilizers, weeding, and spraying.



The diesel-powered chopping machine helps to break down the yellow maize for silage.

### Giving help

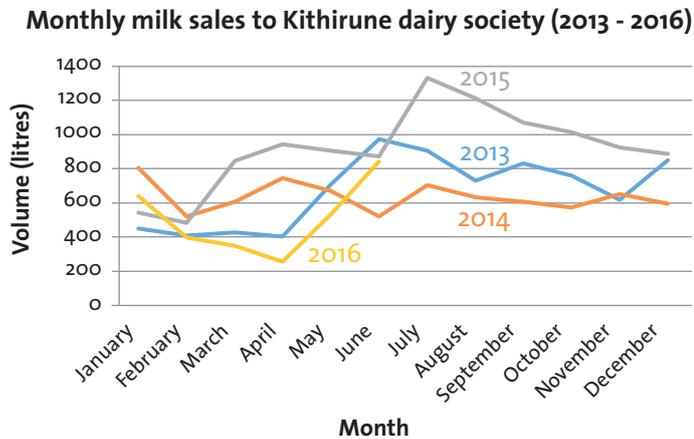
Farmers from Kithirune still visit the chairman's demonstration plot regularly. During these visits Mr Mutuma encourages other farmers to grow more fodder crops for their cows, which will help them to reduce their costs too. Due to the high costs Mr Mutuma thinks this is why most farmers are not keen on adopting lucerne. They would rather grow sweet potatoes, as they hear that this crop suits their area and as they are used to cultivating it.

The graph shows how milk production on the farm increased significantly in 2015. From 18 litres per day from three cows in January 2015 it increased to 35 litres per day from four cows in June 2015. Within six months his monthly income increased from Ksh 20,000 to Ksh 27,000. In 2015, Mr Mutuma was awarded second prize in terms of annual milk production volume brought to the Kithirune society.

*'After I received my award, my fellow farmers now wanted to see what I am doing and I actively share my knowledge: I welcome about ten farmers every month, either from Kithirune or from other societies'.*



Mr Mutuma constructed the zero-grazing unit after returning from the PDTCC.



In early 2016, Mr Mutuma's milk production decreased. He had increased his herd size from late 2015 onwards, but had not increased his fodder production. Because he had also learned to improve the feeding of his non-lactating cows, there was more pressure on his fodder supply. This motivated him to grow even more crops for fodder. The increase in fodder helped him to return to stable milk production volumes by mid-2016.

### Future plans

Mr Mutuma wants to maintain his level of production volumes at the lowest possible production cost without affecting the herd negatively in terms of comfort, hygiene, and body condition score. To achieve this end, he wants to continue experimenting with cultivating different types of fodder crops and find out their nutritional value. He understands the importance of producing sufficient fodder, but he still needs to do a cost analysis to see to what extent yellow maize and lucerne have been beneficial to him. The farmer also wants to modify his calf pen and zero-grazing unit. By the end of 2016 he hopes to produce 20 litres of milk per cow per day.

Mr Mutuma was pleased to be able to host the fodder trials, as they opened his eyes to fodder production and preservation. Moreover, he is now able to influence his peers positively, something he had wanted to do from the beginning.

# Squeezing milk out of dry land

The story of a demonstration farmer in Kiplombe,  
Baringo County



Mr Jackson Keitany.

Mr Jackson Keitany is a smallholder from Kiplombe in Baringo County, approximately 130 kilometres southeast of Eldoret and 50 kilometres northwest of Nakuru. He has over 40 acres of land and his ten lactating cows are producing 100 litres daily. Kiplombe is a semi-arid area and farmers in this area experience even more drought due to climate change. However, even this climate offers a potential for dairy farming. The story of Mr Keitany shows how as a dairy farmer in a dry area, he is still able to increase milk production, using proper management of fodder alongside good feeding practices.



The cow shed houses the farmer's ten cows.

### Never too old to learn

Mr Keitany is about 70 years of age and lives with his wife in Kiplombe, a semi-arid area. He owns 47 acres of land, ten of which are woodland. Before retiring in 2009, Mr Keitany was a government employee and his wife worked as a teacher. After retiring, he experienced health issues. This required him to have a steady income to support his medication. He had already kept some cows on his farm and this motivated him to venture into dairy farming. Since 2009, Mr Keitany, his wife and their two labourers have been working on the dairy farm. During these past seven years, they have been able to grow the farm progressively.

Mr Keitany remembers that at the start of this transition, their four cows together produced a total of 25 litres of milk per day. At the time Kiplombe Dairy Society paid farmers approximately Ksh 15 per litre, resulting in a gross income of Ksh 375 per day or approximately Ksh 11,000 per month. With the assistance of an NGO and the Ministry of Livestock Development that worked in his area, Mr Keitany built a hay store and a cow shed, started using AI for breeding, and started growing maize and grasses for fodder. Mr Keitany also received assistance on silage-making from the staff of the Department of Livestock. However, his wife admits that, even after receiving this support, their overall skills to manage their dairy enterprise were limited. The cows were still grazing in the underdeveloped field and the maize silage turned out to be of poor quality with a lot of spoilage. The drought of 2012 made it clear that the low and irregular rainfall in Kiplombe is a major factor to be reckoned with. The effects are aggravated by Kiplombe's unreliable community water supply.



Mr Keitany wants to improve his calf pen and move it closer to the cow shed.

Mr Keitany remembers that at the time, even the family sometimes lacked domestic water for over a week at a time.

When KMDP introduced extension activities in Kiplombe Dairy Society in 2013, Mr Keitany was already an active member. He used this opportunity to attend training sessions that were organized in his region by the newly employed extension officer of Kiplombe in collaboration with KMDP consultants. He also attended exchange visits to larger and better performing farms. Mr Keitany noted that the training and, more so, the exchange visits, helped him to acquire knowledge on how to improve his farm.

*'After attending an exchange visit in 2014, I knew I had to improve my fodder. That's when I started experimenting with yellow maize.'*

After the exchange visits Mr Keitany built a calf pen, constructed a zero-grazing unit, and started paddocking his farm. KMDP consultants also coached him on the importance of compacting and properly covering his silage pit, things he did not know about silage-making before.

### **Trial and error**

KMDP consultants and Kiplombe's extension officer visited Keitany's farm occasionally and noticed his progress and willingness to learn. In 2014, when KMDP started its

'demonstration plot project', Mr Keitany was selected as one of 20 'demonstration farmers' from the Kiplombe Dairy Society. In 2014, the selected demonstration farmers received seeds for various fodders including sorghum, yellow maize, oats, Columbus grass, Boma Rhodes, lucerne, desmodium, purple vetch, and lupines. KMDP consultants assisted Mr Keitany in preparing and establishing the fodder trials and could be consulted whenever the farmer faced a challenge.

Mr Keitany recounted that his desmodium had poor germination, while the lucerne, yellow maize, and especially the sorghum (a more resistant crop, suitable for drier areas such as Kiplombe) grew well. The other crops suffered from the drought that year. Even though the sorghum yield was high during the first cut, it gave a lower yield during the second cut because of the dry weather conditions. Nevertheless, Mr Keitany was able to use a mix of sorghum and maize to make silage during the second half of 2014. Since the cows responded well to this silage mix, he expanded the sorghum to five acres in 2015. The sorghum grew well and Mr Keitany made silage again, which he fed to his cows in April and May 2016. He was surprised when he discovered that cows did not like the pure sorghum silage and milk production decreased to three to five litres a day. Mr Keitany realized that even though sorghum grew well, it lacked the nutritional value his cows needed. As grasses were not ready to be cut and the mixed maize-sorghum silage was finished, as a last resort Mr Keitany bought 200 bales of Rhodes grass at Ksh 150 per bale in June 2016. He observed that the cows responded well to hay and he was hopeful that the milk production volumes would increase.



The farm family in front of one of the last sorghum plots.

### Up-scaling high-protein feeds

The 2014 demonstration plot taught Mr Keitany and KMDP consultants a number of important lessons. Based on his experiences and with support of KMDP, Mr Keitany up-scaled his lucerne demo plot to one acre in 2015. The aim of the up-scaled demonstration plot was to convince demonstration farmers and others about the difference that high-protein fodders can make in milk production and production costs. Mr Keitany and one more demonstration farmer had received seeds to plant one acre of lucerne and the third farmer had received seeds for one acre of lupines. The 2015 demonstration plot offered plenty of challenges and learning opportunities especially in terms of land preparation. Before the high-protein fodder was planted, the soil was tested by a company called SoilCares Ltd. The results helped the demo farmers to understand the actual condition of their soils and to relate this to the fertilization advice for the crops. Mr Keitany was told to apply 24 bags of lime to adjust the pH level and to buy one bag of fertilizer to increase the yield of lucerne per acre. Mr Keitany remembers that growing lucerne that year turned out to be a challenge.

*‘From the start, germination of lucerne was difficult; the crop was weak and weeds grew much faster than the crop. Based on the advice from KMDP consultants to weed the demo, I hired four workers to weed for two weeks; I paid them Ksh 200 per day’.*



Mr Keitany's wife shows the zero-grazing unit.

After the intensive weeding the lucerne started growing and after that Mr Keitany was able to harvest good yields for about eight cuts. Nevertheless, he had not expected the weeding to be so much work. Once the additional costs of weeding, lime and fertilizers were taken into account, and the fact that the actual nutritional value of (his) lucerne was not yet determined, KMDP consultants question the net benefit. While the cost-benefit ratio is not clear, the consultants are hesitant to recommend that farmers continue to grow lucerne.

### All's well that ends well

Mr Keitany explains that he noted an increase in milk production when he started feeding his cows lucerne alongside maize silage and Rhodes hay. The farmer quotes figures for April 2015, one of the driest months in Kiplombe, when the cooperative society was paying Ksh 40 per litre of milk due to milk scarcity. In that month, Mr Keitany's six milking cows produced a total of over 1600 litres (an increase of 45 percent compared to April 2013), which can only be attributed to improved feeding.

*'I was very happy. While I noted that other farmers were challenged to keep their cows alive, I did not have the same struggles due to the silage; my cows were well-fed throughout that tough period.'*

Mr Keitany's wife says that in one month in 2015, they received an income of almost Ksh 100,000. Mr Keitany used the extra income to invest in his dairy farm, for example to buy machinery. He was also able to take a loan to buy a car and he can now comfortably pay for his medicines. He is using artificial insemination to improve and expand his herd. Currently he has over 30 cows, ten are lactating, and nine will calve down in October 2016. He has six acres under maize, one and a quarter under lucerne, several acres under Napier and Rhodes grass, and a small plot of desmodium. He says he does not believe in sorghum anymore, so he wants to replace those fields with maize and/or grass. The grasses are doing well and during the Rhodes grass harvest Mr Keitany realized he needed to expand his hay shed to store the eight hundred bales.

### Looking ahead

Mr Keitany's age prevents him from doing heavy labor, but he still thinks about the future of his dairy farm. He would like to increase the production of the current ten milking cows from an average of 60 litres of milk per day up to 200 litres of milk per day year-round. In terms of feeding, Mr Keitany feels he has improved over the last two to three years, but also knows he can improve even more. He wants to replace the sorghum with Boma Rhodes grass and intends to check the nutritional value of lucerne and the other feed crops. He wants to improve the cow shed and the zero-grazing unit and plans to irrigate his farm with water from the dam, so he will no longer depend on rains. Furthermore, Mr Keitany says that through artificial insemination

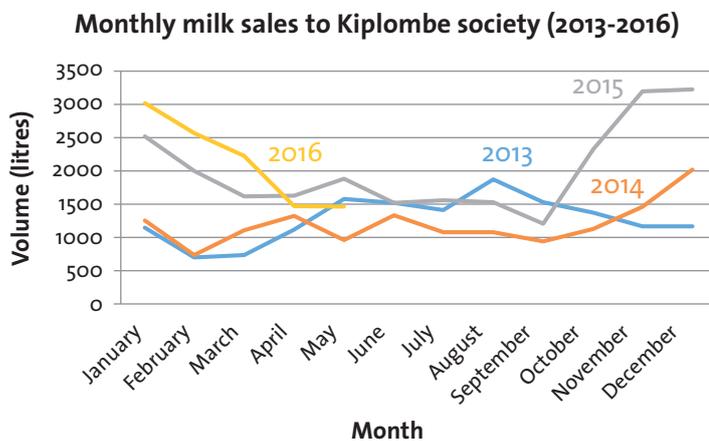


Mr Keitany explains the difficulties in harvesting his Rhodes grass.

he wants to expand and improve his herd in terms of size and quality. This means that he also needs to improve dairy management and buy better, appropriate machines that can help him with land preparation, harvesting and processing of fodder. Lastly, Mr Keitany wants to welcome more (neighboring) farmers on his farm, so they will learn and duplicate what he has been doing. Though the demonstration plot was meant to attract other farmers to Keitany’s farm, the strategy has not worked so far. Mr Keitany thinks that other farmers feel disadvantaged, because they don’t have the resources that Mr Keitany has in terms of land, access to water, and capital.

*‘The other day I was making silage. I invited my neighbours to come and see what I was doing. They didn’t come; they said I’m successful because I have so many acres and I own a dam.’*

The KMDP consultant is more optimistic as she states that other farmers are now talking about Mr Keitany, because they had seen him deliver two 50-litre cans of milk to the milk collection center. The farmers are now wondering where Mr Keitany gets his milk from. The KMDP consultant expects more farmers will visit Mr Keitany’s farm in the near future.



**N.B.** The milk production has increased over the years, but a drop can be seen in April and May 2016, when the farmer fed his cows on sorghum silage.

# Feed cultivation – a growing business

The story of a commercial fodder producer in Ngorika,  
Nyandarua County



Mrs Mary Mburu, Gichua Farm.

Mrs Mary Mburu is a commercial fodder producer. She owns over 70 acres of land, with the majority under Rhodes grass. Mary's story demonstrates how as a commercial fodder producer, she is improving the quantity and quality of hay produced at her farm. She has created a profitable business by embracing advice on proper land preparation and fertilization.



Machinery plays a large role at the farm.

### The switch from dairy farming to commercial fodder production

Mrs Mary Mburu is in her early 40s. She was born and raised in the Lanet area, on the outskirts of Nakuru town in Nakuru County. She lives on Mburu Gichua farm, which comprises 40 acres used for grazing, for production of food crops, and for Rhodes grass. The family owns another 35 acres 20 kilometres away, in a village called Ngorika. This is the piece of land where Mary produces most of her Rhodes grass on a commercial scale.

Mary grew up on the farm, but left home to study in the United States. While she was overseas, her parents used the family's land for dairy farming. Part of the land was used to grow fodder, while the other part was used as a grazing area. By that time, surplus fodder was easily sold to neighbouring farmers. When Mary returned to Kenya, she became eager to transform their fodder business to commercial scale and orientation. With the advantage of high rainfall (over 1200 mm) and relatively good soils, she figured out that the hay produced at their farm would find a market in Nakuru and Nyandarua. When her parents retired, Mary took over the management of the farm and changed its focus from dairy farming to commercial fodder production. She increased the acreage under Rhodes grass and invested in machinery. The farm now owns baling equipment, including a tractor, mower, rake, and square baler; there is also a harrow and a 10-ton truck that is used to transport hay from the farm to the store and/or customers. Though the fodder business is profitable now, Mary remarked that she encountered many challenges on her journey.

### Inefficiencies and uncontrollable factors

In 2012 Mary continued with the fodder production at the point where her mother had left it. The land had not been ploughed for years and the (uncertified) seeds Mary had bought for the fodder production came from unreliable markets. Mary recalled that, when the seeds from her main supplier were not available and she had to buy seeds from another supplier, the crop turned out pink! The acreage under Rhodes grass and maize was small and affected by harmful annual and perennial weeds. The Rhodes grass grew slowly and resulted in poor quality hay. The machines that were used on the farm were old, and broke down frequently. As a result, Mary had to choose between leasing expensive machinery (Ksh 70 per bale), or employing casuals to do the work manually with the chance that the hay would bolt past its prime. Buying new machinery was not advisable, because the market in farming equipment is small and sellers ask outrageous prices. The bales around that time were mostly sold to neighbours and a few larger farmers, who were willing to pay around Ksh 160 per bale.

External factors have made successful feed production commercially unpredictable. In 2012 and 2013, a virus affected all maize planted in Ngorika. Since then, commercial fodder producers have focussed on Rhodes grass rather than maize. In contrast, a prolonged drought in 2014 increased the demand for hay and as one of the few commercial feed producers in Nakuru region, Mary could sell her hay for up to Ksh 300 per bale. This resulted in higher profits and encouraged her to continue investing



The hay baler functions well but may need replacement soon.



Mrs Mary Gichua and a Perfometer consultant check the haybales (17 kg each).

in commercial hay production. Over a short period of time, competition increased due to excess supply from new entrants into this field of enterprise. By that time, Mary had already realized she had to change her production system to improve the yield and quality of her hay.

### How to make fodder production a profitable business

In 2014, Mary heard about KMDP and the support she could get to improve her fodder business. A local dairy advisory company called Perfometer Ltd, started to support Mary via KMDP as one of their commercial fodder producers. Mary, who is enthusiastic and eager to learn and invest in her business, received information on how to improve her agricultural practices during various training and exchange sessions. She soon realized she had to improve her method of land preparation, weed control, and analyse the quality of her soils to determine fertilization needs. At the time, her land was invaded by weeds that often suppressed the grasses. Although Mary did not keep proper records, she could recall that she harvested 35 acres under Rhodes grass three up to four times per year and that every harvest gave her approximately 7000 bales, thus an estimated 600 bales per acre.

The farm then received four advisory visits from local and international advisors in 2014 and during part of 2015. Perfometer consultants alongside the Dutch PUM

experts focussed on promoting progressive improvement through monitoring different stages and seasons to determine the outcomes of the advice provided. Aside from individual farm visits, Mary was invited to peer learning forums, organized as roundtable forums with other fodder producers. KMDP also supported soil analysis for several commercial fodder producers. In each case where soil analysis was carried out, the producers met with KMDP advisors to interpret the analysis results and assess the recommended fertilizer regime. Mary was among the producers who followed recommendations.

### A new start

Mary says that the advice she has received from KMDP advisors has been effective and has contributed to moving her haymaking enterprise to a higher level. She recalls the first time the PUM expert came to her farm:

*'[The PUM expert] came here and told me to start all over again. I believed him so I tried to convince my mother, who first disagreed, but later accepted and we ploughed all the land.'*

Mary hired labourers to plough all the land and to get rid of the old grass. The advisors observed that Mary had already started sowing before the land preparation was completed. They advised her to apply the recommended fertilizer and herbicides (glyphosate and 2.4-D) on the land that was not yet under cultivation. She did as advised and now she has 30 acres of Rhodes grass with correct land preparation and planting procedures and only five acres of Rhodes grass without it. For management purposes, she increased the number of casual labourers during the sowing and harvesting seasons, while two labourers remained at the farm longer to assist with the continuous management of the grass field.

At some point, Mary noticed that supply from the seed companies had become inconsistent and realized that she stood a high risk of running out of seed completely. In order to ensure supply and reduce the cost of buying seeds, she left a section of her grass to mature and produce seeds for replanting. While her method of harvesting seeds was cumbersome and time consuming, her own production of seeds turned out to be more economical and the quality of seeds more predictable. She realised that producing her own seeds had become an emerging survival strategy in response to the inconsistent supplies from the seed companies that were authorized to supply Rhodes grass seeds.



Rhodes grass mixtures with (top) and without (bottom) proper nitrogen fertilization; recommended rate is 100 kgs CAN per acre.

### Investments bear fruit

Currently, Mburu Gichua farm has over 35 acres of Rhodes grass. The plots where the recommended fertilizers and herbicides were applied look greener, taller, and leafier (see pictures). The herbicides have helped to control the weeds, while the nitrogen boosted growth and increased the protein content of the grass. Two and a half months after planting, in December 2014, the grass was ready to be harvested. One of the Perfometer consultants, who is a crop expert, remembers:

*'The crop was dense with healthy dark green foliage and grew up to one meter high.'*

Since then, Mary has been able to achieve three harvests annually. She estimates that her yield has grown by at least 33 percent compared with previous years. She used to harvest 7000 hay bales from the 35 acres, but has managed to reach 10,000 bales with proper fertilization. The five acres without proper land preparation look dry and are overtaken by weeds. Grasses from this land are not harvested, as a way of maintaining quality.

Mary sells the bales for a year-round price of Ksh 250 and tries to maximize the quality by controlling the entire value chain (planting her own purchased seeds, proper land preparation, management, harvesting, and storage). Every bale is around 17kg at the point of sale. Neighbours sell their bales for Ksh 220 or sometimes even as low as Ksh 150, but Mary knows that the quality of her bales is better and therefore can be slightly expensive to cover the additional investments in cropping.

*'Our customers trust us, that's why they come back to buy our hay.'*

Mary currently has five contracted customers. Some of them were introduced by Perfometer Ltd, while others were drawn by Mary's own marketing efforts. Next to the contracted customers, many other customers stop by to buy on an as-needed basis. The hay shed is currently fully stocked with bales, but Mary expects that the buyers will come as soon as the rains stop. Mary now keeps up-to-date records of her farm activities, including crop history, labour cost, rates, and types of inputs (including fertilizers and herbicides). This has helped Perfometer consultants to calculate the costs of production: The total gross turnover from the three Rhodes grass harvests in 2015 led to a revenue per acre of Ksh 65,450, while the total costs for land preparation, management and harvesting were Ksh 34,500. This resulted in a gross margin of Ksh 30,950 per acre from the 35 acres. The costs for one-off expenses were high in 2015, so Mary expects that her profit from harvests will double in the next two to three years.

### The future as an entrepreneur

Mary has acquired enough (technical) knowledge to implement good agricultural practices not only to maximize her hay yield, but also improve the profitability of her business. As a result, KMDP and Perfometer consultants no longer need to visit the farm. The programme continues to identify new fodder producers who may need support within the project time frame. Mary's farm is still seen as a progressive farm for market linkages as well as for peer learning.

Mary says that her main challenge today involves the farm machinery, because the current machines are old, dysfunctional, and increase the cost of land management. The farm needs a new goHP tractor suitable for chiselling, a mould board plough, and power harrow. However, there is no prospect of that yet.

*'It's hard to find trustworthy companies that are selling agricultural machines. Our tractor is very old, but we choose to continuously use it, fix it when it breaks down, and buy spare parts when necessary'.*

Mary is still trying to find trustworthy suppliers, because new machines will help her to intensify the hay production, and will also help her to start developing the acres of land around her house that are not properly utilized yet.



Hay harvested during the rainy season is sold during the dry season.

# Youthful energy

The story of young farmers starting a silage-making enterprise in Mbwinjeru, Eastern Region



Bidii Dairy Promoters Enterprise.

The Bidii Dairy Promoters Enterprise is an SPE group formed within the Mbwinjeru Dairy Society. It has become a success story of young people creating employment in the agricultural sector by responding to the demands of their immediate market. Bidii means 'effort' in Swahili. Read this story to see how the Bidii members put in the work and enthusiasm to establish their own enterprise, how they have benefited from it so far and what the future might possibly hold for them.

### How it all began

The Bidii Dairy Promoters Enterprise started as a group of six young farmers from Mbwinjeru area. Mbwinjeru is located in Meru County, only a few kilometres south of Meru town. In this area, farmers are active in different types of farming activities, including tea, horticulture and dairy. The Bidii members applied for the service provider's enterprise (SPE) training with various objectives, but eventually had one main goal: to earn a decent living by having an extra source of income through an enterprise that would support the farmers in their area.

These six young farmers were trained in November 2014 at Mawingu Practical Dairy Training Centre (PDTC) by KMDP and Perfometer consultants to learn about both good fodder management and group dynamics. An older and more experienced SPE group (established by Perfometer) and KMDP consultants started mentoring this new SPE group (see box).

### Branding the business

After coming back from the intensive five-day training at the PDTC, the Bidii group members took steps to form their enterprise. They selected the office bearers (the chairman, treasurer, and secretary) and established their own rules. Their first aim was to build confidence in their silage-making skills. To that end, the first three silage-making activities by the group were conducted with advice from Perfometer and other consultants from KMDP and the first attempt was made at the Bidii's chairman's own farm.

#### Training of Bidii Dairy Promoters Enterprise

- Six farmers were selected from more than 15 interviewees by KMDP, Perfometer consultants and the Mbwinjeru society management.
- The six selected farmers were trained as part of a group of 20 for one week by KMDP and Perfometer staff at Mawingu PDTC.
- The training helped the participants to acquire skills in silage-making, general dairy management as well as entrepreneurship and group leadership.
- After the PDTC training, the SPEs were set up as business. They registered as self-help groups and selected officers.
- The Bidii members were monitored and followed up by KMDP staff alongside an existing SPE-group. They checked how the Bidii members made silage and checked on the quality. When necessary the members received extra advice and training.
- SPE members continue to build their skills, delivery methods and confidence in working with farmers through training and close guidance from KMDP staff. This helps to ensure that clients are well-served, receive satisfactory results and are well-profiled for repeat business.



The original SPE group mentored the Bidii members from the moment they finished their intensive training.

*'After three months we opened my silage pit and we saw it was good: 'Yeah, we can make it!' we said. We went to the second farm and opened again after three months and we saw it was quite okay. Then we knew we had gained competence.'*

In fact, from the time they began making silage, there has been no case of spoilage in the silage they have made. Even so, they have been continually working towards improving their silage quality through proper establishment, timely harvesting and proper silage preparation, compaction, and covering.

The next step was to market their services among Mbwinjeru farmers using different strategies. Their first strategy was to actively promote themselves by sending word about themselves and their services through neighbours and friends, but also by visiting other farms. The second strategy was using the Mbwinjeru Dairy Society's own marketing channels. Mbwinjeru's chairman had been instrumental in promoting the Bidii members in the society's meetings and training sessions. KMDP's consultant also agrees that he observed a lot of goodwill from Mbwinjeru Dairy Society towards the Bidii group.

*'The Mbwinjeru society acknowledges the Bidii SPE and allows them time to inform the members about the services they offer. When the society has an Annual General Meeting or field day, the board members of the society organize a tent for the SPEs and, in this way, promote themselves.'*

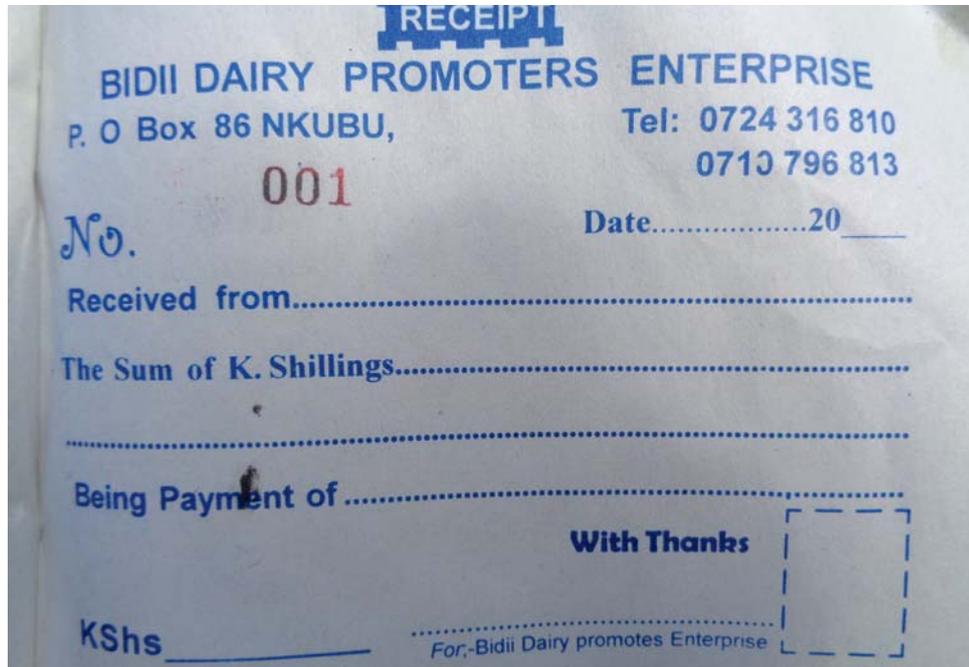
The third strategy was to use social media platforms, such as Facebook and WhatsApp groups, to share pictures of their ongoing work. According to Bidii's chairman, this way of marketing mainly reaches the upcoming potential farmers.

*'We post pictures on our own Facebook page and we all have a different network. We've also created a WhatsApp group called 'Farmers Centre' with about 40 farmers.'*

Next to branding their business, Bidii members also needed to have an incentive to work as a group. SPE groups in other dairy societies often have difficulty collaborating, as they see more short-term economic benefits by working as individuals. Strong leadership in the Bidii group proved to be key in motivating Bidii members to keep working together. The chairman of the group emphasizes transparency and integrity in the group, partly by making sure every assignment is attended by at least two members. Decisions are made as a group, meetings are organized on a monthly basis and members have to use official receipts to acknowledge payments. These receipts are required to be signed by the 'clients' and then are handed to the office bearers during meetings. The chairman has been able to enforce these rules. There are two reasons for the acceptance of his authority and leadership. Firstly, he is older than most of the members and as such, they view him as a mentor. Secondly, the chairman is a respected farmer with a broad network in Meru County. The chairman therefore has a key role in customer acquisition and the other members realize they need the chairman to attract business.



Bidii SPE members are awarded certificates of competency by KMDP's team leader.



Bidii uses receipts to create transparency and to show professionalism.

### The start of a successful business

Once the Bidii Dairy Promoters had gained expertise and confidence in offering silage-making services, combined with their loyalty to each other and their reputation among Mbwinjeru farmers, Bidii Dairy Promoters were now able to invest seriously in their enterprise. In April 2015, the group printed a receipt book for invoices branded with their business name. In June 2015 the group was registered as a business under the name 'Bidii Dairy Promoters Enterprise'. One of the major investments for the group was to acquire a 20.5 horsepower chopper to ease their workload. The chopper was not only fast, but it also cut the maize into correct lengths. They also bought a 200 litre metallic water drum for compaction.

*'The first six months, we used a chaff cutter to chop the maize; some work took up to three days; we could only start preservation on the fourth day. Now the chopping is done in a few hours and we can make silage that same day.'*

In mid-2015 the Bidii Dairy Promoters approached KMDP for financial support to buy the chopper on a 50/50 basis. The chairman recalls that this machine not only made the work easier, it was also an encouragement to invest further in the group. What the group used to do in three days, was now done in a few hours. The machine boosted the business and more farmers could be assisted. However, though the

chopping improved, compaction of maize remains a challenge even today, because it requires the members doing hard manual labour.

In early February 2016, over a year after its foundation, the Bidii Dairy Promoters Enterprise has assisted over 200 farmers with silage-making services. Together, the members conserved a total of 544 tonnes of silage and earned Ksh 230.000. Currently, the group has savings of over Ksh 40.000. The group members charge a minimum of Ksh 600 per member per day. One of the Bidii members remarked that working in the business had turned his life around: he now lives more comfortably and is able to sustain his family properly. The benefits are not just confined to the group members themselves. In 2015 two Bidii members left the group to study and the four remaining members decided to employ three younger men who had completed secondary education and were inspired to join the group after having visited the chairman's farm. In addition to this, whenever there is a major silage-making activity, the group contracts fifteen casual labourers (who earn Ksh 300 per person per day). This mostly happens during peak seasons.



The Bidii members purchased a pulveriser that eases the work.

### A promising business

Bidii group remains the most active SPE group in the region. The members are actively promoting their services outside Mbwinjeru area. One of KMDP's consultant remarked that Bidii has been making silage 'beyond their borders'.

*'I heard a member of another SPE group [Nkuene SPE] complaining about Bidii working within their region and taking their customers.'*

According to Bidii's chairman, the group is currently also competing well with the older SPE group that coached them during training. Before this, farmers in Meru used to contract SPE's from other regions, some over 100 kilometres away. Bidii has been able to take over most of those commissions and provides the service more cheaply due to the advantage of proximity. They also collaborate with other SPE's, especially in the use of fodder chopping equipment. The collaboration has been healthy and the farmers are happier with this service. When smallholders in other regions contract the Bidii Dairy Promoters and the farmers are pleased with the quality and promptness of their work, they send a good report to their neighbours. This has greatly increased their referrals. Bidii's chairman has concluded that more jobs are on the way.



The group compresses the maize with water drums.



A pit is dug for the silage.

Bidii members have not only been able to make silage and to assist other farmers to do the same. They have also been able to advise farmers on proper land preparation methods, fodder management, general dairy management, and the supply of silage-making materials. They are now offering these services at a fee, as agreed between the SPE and the farmer (client).

The Bidii group is eager to expand its business in even more ways. Firstly, the group plans to purchase another chopper, because the current one is not adequate for the amount of work they get. Secondly, the group wants to make an internet webpage for online marketing. Thirdly, the SPE members plan to increase the number of members from six to twelve and the enterprise wants to partner with other youthful service providers and possibly sub-contract work where possible. Lastly, the group plans to expand the number of services they offer. They would like to venture into other businesses, such as seed distribution or working with other contractors and input suppliers to distribute their products. The Bidii group also plans to package its capacity and work profile in such a way that it can work beyond the boundaries of Meru County.



## NEW PLATFORMS FOR LEARNING

With dairy farmers seeing the benefits of adopting 'good dairy farming practices', the demand for training has increased. Government training and extension services were reduced to almost zero due to the structural adjustment programme in the nineties and the private sector has been slow to fill this gap. Mid-level training institutes and universities offer certificate and diploma courses in dairy, but these have very limited practical training content and are not easily accessible to farmers. It is promising to see that farmer organizations, dairy cooperative societies, dairy farms, and private advisory firms are picking up the challenge of training farmers and farm managers so that they acquire the skills needed to run their farms profitably.

KMDP's work on practical training and skills development has a number of different components. The following four stories demonstrate new avenues that were developed to enhance access of farmers to practical knowledge and skills. The stories about Lewa Practical Dairy Training Centre (PDTC) and the Ainabkoi Progressive Farmers Group show how smallholder dairy farmers' access to knowledge required for improving their dairy enterprises has been facilitated. The stories of two medium-scale dairy farmers, one from the Central region and one from the North Rift region, show how exposure visits and advice from international dairy experts and local dairy consultants can help to exchange knowledge and skills to enhance dairy farm management.

# Children's charity branches out

The story of a professional centre for skill development in the North Rift region



Lewa Practical Dairy Training Centre at Baraka Farm.

Lewa Practical Dairy Training Centre (PDTC) is located approximately 20 kilometres northwest of Eldoret. This training facility is located on a well-managed dairy enterprise, called Baraka Farm. The success of the Lewa PDTC clearly demonstrates two things: that a progressive dairy farm can integrate a training component and that demand for practical training in the market is growing. This shows what a PDTC can offer and to whom, and what still needs to be done to make the PDTC a promising business model.

### How it all began

The Lewa Children's Home Trust runs a home that accommodates between 50 and 120 children. Phyllis Keino, the founder of the home, also established a farm, called Baraka Farm. The original idea was that the dairy farm would sustain the children's home, mainly by using the farm to produce food and generate income for the children's home. Under the supervision and coordination of a Dutch manager, Baraka Farm has become a commercial dairy, crop



Baraka farm is used for demonstration and discussion.

and horticulture farm that provides the children with vegetables, milk and other farm products. Baraka Farm is also unique, because it processes its own milk into cheese and yoghurt under the name Baraka Farmhouse Cheese Ltd. These products are now sold to renowned hotels in major towns in Kenya. At first, when other farmers began visiting the farm, the owner and manager of Baraka Farm observed the value of sharing knowledge about dairy farming, especially to smallholders. Both parties were enthusiastic and came up with the idea of a structured practical training programme. The manager developed a training package and the idea of training at the farm was first piloted in 2007. However, three main challenges constrained them from moving to the next step: the lack of specific and up to date training materials for the target groups, sufficient funds to improve the facilities, and the shortage of qualified trainers.

#### KMDP support to PDTCs

- Local and international KMDP consultants advise the farm to implement best farm practices in young stock management, feeding, fodder management, and cow housing.
- Training infrastructure is improved. One of the PDTCs requested a financial contribution for the construction of a classroom and accommodation facilities. KMDP worked with Lewa PDTC to improve the content and layout of nine training modules that are now being used in all three PDTCs.
- PDTC trainers received capacity building from international trainers (advisors from PUM, The Friesian, Q-point and Vetvice) and local trainers through Training of Trainers (ToT) programmes.
- Linkages between PDTCs and their potential clients are established. This is done by sponsoring training of at least ten progressive farmers per dairy cooperative society working with KMDP.
- KMDP supports the PDTC's in marketing by providing an online platform where PDTCs can market their training programmes.



A field with Napier grass for learning purposes at Lewa PDTC.

### Giving a good idea a boost

In 2013, KMDP carried out a scan of farms that were offering some form of training to farmers across the country. The programme identified 13 farms and selected three for further technical support; among them was Baraka Farm (see box). Among the reasons for selecting Baraka Farm were the existing infrastructure, the progressive performance of the dairy unit, and the motivation of both the owner and the manager to facilitate training. With the support of KMDP, Baraka Farm opened its dairy farm once more for learning purposes and named the training centre after the children's home 'Lewa'. It agreed to operate on a small scale, starting with between ten and 20 participants per week. For the one-week training course, a trainee pays Ksh 15,000, amounting to an income for Lewa PDTC of between Ksh 150,000 and Ksh 300,000 per week. This is how Lewa PDTC was established.

### Lewa PDTC's training scheme

Lewa devoted two and a half acres of its total land space to train farmers. The PDTC offers a one-week (five day) training course for smallholders. Training modules were developed in collaboration with the Dutch Habari Foundation. The eight modules are now used to train farmers on the following topics: Napier grass management, housing, calf rearing, hygienic milk production, health care, fertility, herd record keeping, and financial record keeping. On Baraka farm practical training sessions are organized that demonstrate dairy farming. The farm has, amongst others, over 80 Holstein Friesian cows, a zero-grazing unit, a cow shed, and a milking parlour. Different types of high-

protein and high-energy fodder crops are grown around the farm. The farm has a young stock rearing unit with a modern zero-grazing system that helps to achieve high growth rates for young stock. The training sessions are scheduled to routinely start on Mondays and end on Fridays, with the content being 60 percent practical and 40 percent theoretical information. For the theoretical training sessions, the trainees are gathered in a classroom with video equipment and TV screens. The building also includes accommodation for trainees, group catering facilities, and a dining room.

### Resounding success

Between 2003 and 2015 over ten thousand guests have visited Baraka Farm for training and exposure to good farm practices. The guests included farmers, livestock officers and students from all over East-Africa. To date, Lewa PDTC-Baraka Farm has hosted over a thousand trainees. A total of 303 of these trainees were smallholders and young farmers from the eighteen dairy societies who participated in the one-week training sponsored by KMDP. Approximately 80 percent of these attendees were male, and 20 percent were female. The PDTC also trained 124 others in the five-day training module. An additional 600 trainees attended one-day training sessions at the PDTC.

### Hurdles still to be taken

The infrastructure of the dairy training centre is now established and farmers have become aware of the training opportunities offered. However, the concept also has challenges. Firstly, the combination of the dairy training and the children's home in one place tends to constrain changes to the infrastructure, for example when equipment is sometimes needed both at the training centre and at the farm.

A second challenge is the marketing of the programmes and attracting trainees.



Mr Jos Creemers of Lewa PDTC teaches trainees in a classroom session.

'Paying for training' is a new concept in the farming sector that is not yet widespread. Whilst it is well understood that training is valuable and should be paid for, the concept of a farm charging others farmers for training has not yet been accepted as normal. In Lewa PDTC's case, where training was first offered for free, the PDTC's manager suggested that it would take time before the mind-set is changed, even though the costs are sometimes partly covered by sponsorship from KMDP and other NGOs.

A third challenge for farmers interested in training, is them being away from their homes and farms for one week. Smallholder dairy farmers have an indispensable role on their farms as most of them do not employ trained or experienced managers. They supervise the farms by themselves with the assistance of unskilled or semi-skilled dairy workers. This situation is even worse for female participants who, besides managing their farms, also manage their homes. A period of absence incurs the extra cost of hiring a temporary replacement.

The fourth challenge for Lewa PDTC is the high turn-over of trainers. The trainers in Lewa PDTC are of a relatively higher skill level compared to their peers. In most cases, they are graduates from universities and attended 'training-of-trainers' skills development programmes facilitated by KMDP. They also have practical experience due to their role as dairy manager cum trainer at the PDTC. Lewa PDTC's manager remarked that trainees, government departments and/or companies 'poach' his staff. The trainers are offered higher benefit packages, which win the trainers over to the next employer. Replacing the trainers and equipping them afresh with practical knowledge, becomes a pressing challenge for Lewa PDTC, which is both expensive and disruptive.



Lewa PDTC trainees measuring dimensions of a fodder trough.



Lewa PDTC trainees measuring dimensions of a fodder trough.

The final challenge that constrains Lewa PDTC is capital. The PDTC needs to invest more in the dairy farm to be able to run the PDTC. One of the main components of a successful PDTC is having a well-performing dairy farm. However, according to the farm and PDTC managers, the dairy farm still requires heavy investments. The revenue generated from training ten farmers per week is more of a cost recovery than a commercial venture. It remains a challenge to keep up the quality of the services and training facilities at the PDTC.

### Looking ahead

Whilst Lewa PDTC's manager acknowledges that the concept of practical training for a fee will take time to be embraced, he believes that it is one of the best ways for skill exchange, especially with smallholders who may not be able to afford costly training programmes. Lewa PDTC plans to continue operating the farm, with the PDTC and the milk processing unit being treated as two separate profit centres. As one way of building business, Lewa has partnered with iCow, an agricultural information service in Kenya, to increase the marketing of the programmes. The training modules for smallholder farmers have already been shared with NGOs in other countries, such as Ethiopia, Uganda, Tanzania, and Malawi. The PDTC plans to expand its partnerships to reach more input suppliers and service providers for hands-on training of their staff on dairy management. Lewa has also approached several colleges, such as Baraka Molo, DTI, and Egerton, to offer practical training to their students. This will benefit them, because exposure to practical dairy knowledge could help graduates from these schools in the job market.

# Stronger together

The story of ten leader farmers in Ainabkoi collaborating to develop their farms



Ainabkoi Progressive Farmers group.

This story about farmers from the Ainabkoi Dairy Farmers Cooperative Society shows how ten leading farmers from the same region were able to make significant progress by committing themselves to developing their dairy farms together. They were very willing to share their skills and knowledge by opening up their farms to other smallholders so they could learn from them. Read this story to see how the Ainabkoi farmers were able to accomplish their goals by supporting each other and how they are now forming an example to their peers.

### Setting up the model peer group

The Ainabkoi Dairy Society is located in Uasin Gishu County, approximately 70 kilometres southeast of Eldoret and 12 kilometres off the Eldoret-Nakuru highway. In 2015, the society had approximately 400 active milk suppliers and collected on average 5,500 litres of milk per day in the rainy season and 3,000 litres in the dry season. In late 2014 KMDP consultants approached ten high potential farmers from the Ainabkoi Dairy Society to form a peer group which they called 'lead farmers'. Most of them were also local teachers running their dairy farm alongside their teaching job. The average land size was 26.5 acres and the average herd size 16 cows. The two members who have since left have been replaced by others (see milk graphs). The table shows individual farm data about the number of lactating cows and the average daily milk production per farm and per cow in 2015:

**Data on Ainabkoi's lead farmers, collected in early 2015.**

Farmer	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
<b>Number of lactating cows</b>	5	6	5	8	11	5	3	4	7	8
<b>Average milk production per farm per day</b>	23	30	26	60	49	26	15	20	30	35
<b>Average milk production per cow per day</b>	4.6	5	5.2	7.5	4.5	5.2	5	5	4.3	4.4

### From subsistence to surplus

Most of the ten farmers had already been active in attending extension and training activities organized by Ainabkoi's extension officer and KMDP consultants since mid-2013. Their interest in extension activities increased as they saw the positive effect it was having in addressing their main challenge, which was to feed their herds year-round. The farmers often faced milk production shortages, and some even lost cows to drought especially in the dry season between November and April. The lead farmers acknowledged their need to learn and adopt good dairy practices as a way of up-scaling their dairy farms into commercial rather than subsistence enterprises.



Grass conserved in one of the member's farm.

The pioneer farmers were sponsored by KMDP to attend a five-day training at Willens PDTC in the North Rift region in April 2015 (read more about PDTCs in the case study on Lewa PDTC). The farmers paid for their own transport as a way of demonstrating motivation and interest in the training sessions. During the sessions at Willens PDTC, the farmers were trained in the basics of good dairy farming practices. They registered their

group with the Ministry as a self-help organization called 'Ainabkoi Progressive Farmers Group' (APFG) and they opened a bank account. The group consisted of farmers spread out all over the Ainabkoi district, but this did not form an obstacle as one farmer involved commented.

*'We were impressed by the training at the PDTC and we [as lead farmers] could get along very well. We had seen each other here and there, but we didn't know each other before.'*

Apart from the training at the PDTC, the APFG members also agreed on targets as a group, and drafted individual work plans with deadlines to improve their farms. Since the PDTC training, the KMDP consultant and the extension officer have been visiting the individual members at their farms on a monthly basis, helping them to achieve the targets they have set for dairy production.

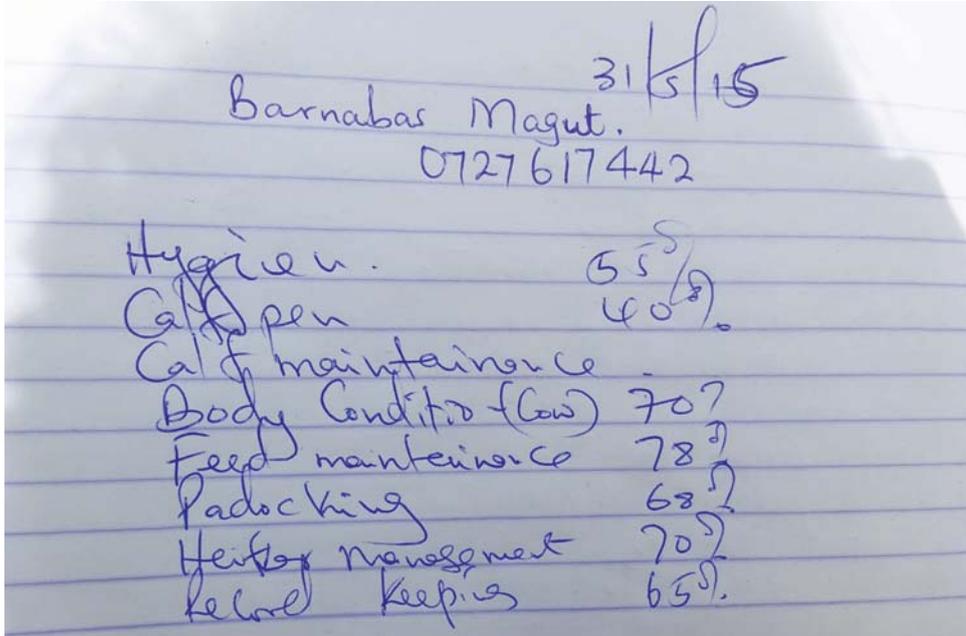
#### A lead farmer receiving support from KMDP

One of APFG members explained that, early in 2015, he had the lowest income from dairy compared to the rest of the members of the lead farmers group. This farmer now has the highest production in the group. He attributes this to the intensive guidance he has been receiving from the KMDP consultants. He states:

*'The consultants are very serious. They tell us to do what we were trained to do: making silage and planting high-protein fodder crops. I was almost removed, because I didn't plant lucerne, while the consultant selected me as a demonstration farmer. I didn't plant in time, because there was no money. [...] The consultant threatened to take it back. When the people sent by the consultant came to my farm, [...] I just started the liming and the ploughing.'*

#### Lead farm visit activities

1. Host farmer takes the visiting farmers for a tour.
2. The visiting farmers give feedback to the host farmer based on the farmer's work plan and score to show progress.
3. The farmers have a meeting to discuss the group work plan.
4. The farmers receive training by KMDP's consultant, the training and extension officer, and/or input suppliers.



Feedback for a lead farmer from his peers on the progress on individual farm targets.

### Group activities

Within one year, the lead farmers had transformed from being complete strangers into a close-knit group that shared the same ambitions and knowledge about dairy farming, who complied with the official rules they had drawn up themselves and who jointly took steps to improve their farms. Their organization stands out because of its well-organized group training sessions, the healthy group finances, and the well thought-out group rules.

*Group training sessions* have not only provided a forum for peer learning, but have also contributed to bonding in the group. They set up a format for the rotational farm visits (see boxes). First the host shares his farming objectives with the visiting group members. Thereafter he facilitates a tour around the farm and receives feedback about his farm practices. The monthly visits are routinely accompanied by training sessions, which are either given by a KMDP consultant, the extension officer, an input supplier, or a service provider. Up till now, the group has already met fifteen times in thirteen months with an average attendance of 80 percent.

*Group savings* – from the start every member has contributed Ksh 1,000 per month to the group's account, of which Ksh 900 goes to the APFG bank account and Ksh 100 goes to the hosting farm, for the provision of meals during the monthly meeting. The APFG savings are intended for shared investments and for providing loans to the individual members. So far the group has bought a tag applicator and a maize silage chopper (second-hand, imported from the Netherlands). The APFG paid a deposit of Ksh 100,000, while the total cost of the chopper was Ksh 250,000. The purchase has



The lead farmers actively plant at least one acre of maize for silage.

several benefits. Most importantly, it speeds up the silage-making process, making it more labour efficient and less tedious. Secondly, the farmers plan to lease it out at a fee set by the group. Group members can lease it at Ksh 8,000 a day, while non-members can lease it at Ksh 12,000 a day.

Individual APFG members can apply for loans from the group savings. Once approved, the group treasurer keeps track of the individual loan accounts. Whilst the group members trust their treasurer's ability to handle their money, they also have their one simple internal control.

*'For transparency, in every meeting, she [the treasurer] has to show us the receipts.'*

**Adoption rates of good dairy farming practices by the lead farmers**

Farmer	Adoption rate	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
<b>Calf rearing:</b>											
- Calf housing	50%	x	x	-	x	x	-	-	-	-	x
- Monitoring of calf growth	40%	-	-	-	x	x	-	-	x	x	-
- Calf feeding practices	100%	x	x	x	x	x	x	x	x	x	x
- Calf body condition	90%	x	x	x	x	x	x	x	x	-	x
<b>Cow management:</b>											
- Zero-grazing unit	40%	x	x	-	x	x	-	-	-	-	-
- Cow housing	80%	x	x	x	x	x	x	x	-	-	x
- Feeds and feeding	90%	x	x	x	x	x	-	x	x	x	x
- Control measures	100%	x	x	x	x	x	x	x	x	x	x
- Breeding/calving interval	40%	-	-	-	-	x	-	x	x	x	-
- Body condition	100%	x	x	x	x	x	x	x	x	x	x
<b>Preservation methods</b>	90%	x	x	x	x	-	x	x	x	x	x
<b>Water harvesting</b>	100%	x	x	x	x	x	x	x	x	x	x
<b>Age at breeding</b>	10%	-	-	-	-	-	-	x	-	-	-
<b>Calving intervals</b>	20%	-	-	-	-	x	-	x	-	-	-
<b>Record keeping</b>	70%	x	x	-	x	x	x	-	x	x	-
<b>Hygiene:</b>											
- Cleanliness milking parlour	30%	-	x	-	x	-	-	-	-	x	-
- Cow health and cleanliness	100%	x	x	x	x	x	x	x	x	x	x
- Milk handling and storage facilities	90%	x	x	x	x	x	-	x	x	x	x



Thirdly, the APFG has set its own group rules to challenge the members to adopt good dairy practices at their respective farms. After returning to their farms from the PDTTC, the members agreed that each of them should have at least one acre of land under maize for silage, and should establish at least one variety of a high-protein fodder crop. They also agreed to use artificial insemination for breeding.

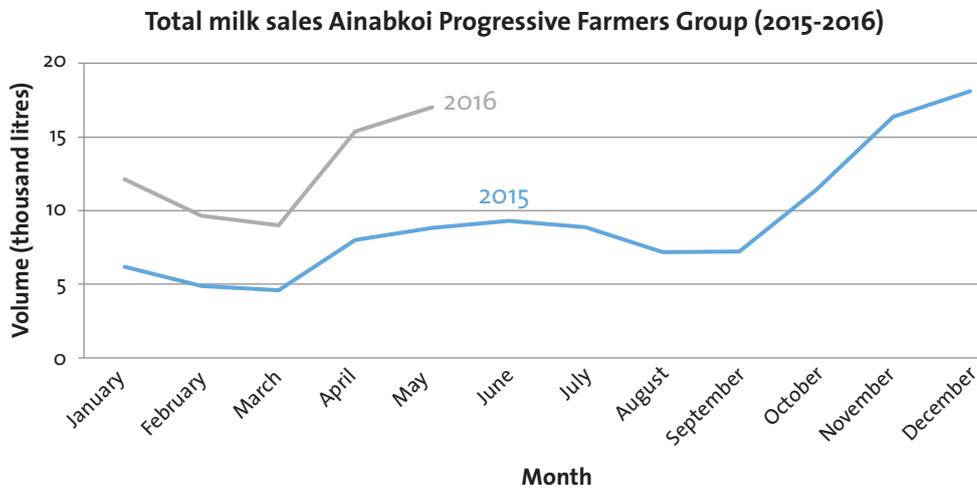
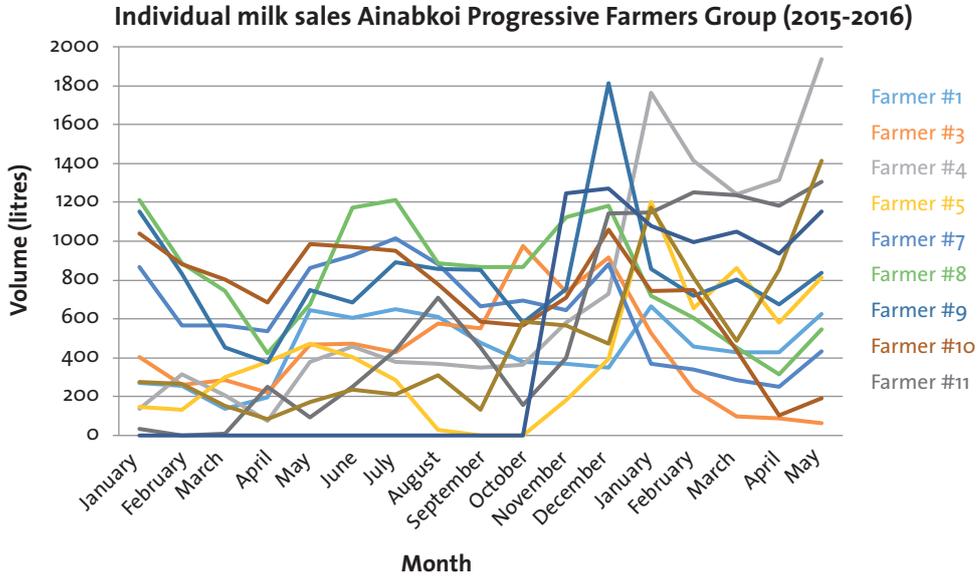
At the beginning of 2016 the APFG requested an exchange visit to the lead farmers of the Mbwinjeru Dairy Society, Meru region. Farmers in the Meru region have less land in general, yet they have been producing more milk per day compared to their Ainabkoi counterparts. KMDP approved the visit, and when the group returned, they adjusted their individual and group work plans to improve their dairy farms. The APFG adopted a new set of guiding rules, where every member was expected to keep the cows in a comfortable and hygienic environment, give cows the right quality of feed, and optimize calf rearing; resulting in heifers weighing at least 350 kilograms at 16 months before being serviced. In addition, they had to deal with their animals' health issues and optimize water catchment on their farms. Inspired by the Mbwinjeru farmers, the APFG set a joint monthly milk production target of 10,000 litres by the end of 2016.

#### **The impact on lead farmers and the wider dairy society**

Data shows that the APFG members have made progress (see table). They have all registered an increase in their milk production and have reported a reduction in incidences of tick infestations and diseases such as mastitis. The APFG is a shareholding arrangement, and according to the group secretary, some members have more resources to invest in their farms than others. Although this puts some at a personal disadvantage, it does not compromise the collective effort to improve their dairy practice and their welfare.

The KMDP consultant reported that the APFG members reach decisions quickly and are led by a young, strong, and decisive chairman. He has coordinated the group well and ensured that all members complied with APFG requirements to plant maize for silage. Eighty percent also planted high-protein fodder crops. Group-targets regarding hygiene, calf rearing, etc. are evaluated during the monthly meetings.

The APFG has become a reference point for many farmers in Ainabkoi. Some want to become members of the APFG; as a result, the group admitted an eleventh member in November 2015. They however, do not intend to expand any further. A second group of farmers has since been formed with the same goals. The two groups exchange knowledge and learn from each other.



N.B. Total milk volumes from the APFG to date. The dry season runs from November to April.

# From modest hobby to main interest

The story of a medium-scale farmer in Moiben, North Rift region



Mr Jeffrey Samoei and his wife.

Mr Jeffrey Samoei is a medium-scale farmer in the North Rift region. He currently owns a total of eight hundred acres of land. Of these, 220 acres have been set aside for over one hundred dairy cows (including young stock). Mr Samoei is an example of a medium-scale farmer who, through consistent and focussed support from KMDP, has been able to improve milk production on his farm. He doesn't want to stop there. His ambition is to continue the growth of his farm production with a clear projection of what he wants it to reach within the next five years.



Mr Samoei learned about establishing a silage pit when visiting the Netherlands.

### The start of Samo farm

Mr Samoei, a farmer in his early thirties, lives with his wife and their three children in Moiben, a village 50 kilometres north of Eldoret that is known as a fertile area for crop production. Mr Samoei was previously involved in the management of the family's real estate business. He took over Samo Farm from his father some five years ago. He continued with the core business of the farm, which was the production of maize and barley. These were used as cash crops: barley was sold to a brewery and maize seed was sold to the Kenya Seed Company. Mr Samoei remembers the business in maize and barley production as a good business, except that it only flourished when the weather conditions were favourable. Mr Samoei also received over 200 cows from his father, which he initially viewed as a hobby rather than as a commercial farming activity. The cows were left to graze in the undeveloped grass fields.

Over the last three years, crop farmers in the North Rift region started to see fluctuations in their incomes. Climate inconsistencies led to unpredictable rainfall patterns and some rainy seasons failed completely. This has resulted in poor harvests and, as a result, unstable prices and enormous losses. In 2012, ten medium- and large-scale dairy farmers gathered in the North Rift region and established the Eldoret Dairy Farmers Association (EDFA). Mr Samoei attended this gathering to explore opportunities for the growth of his dairy farm. In the years since then, he became an active member of EDFA, which has influenced him to gradually change his focus to the dairy side of the farm.

### The turning point: from crops to dairy

In 2013, KMDP consultants met with the members of EDFA and used this network to reach medium- and large-scale dairy farmers within the North Rift region. When KMDP and EDFA signed a cooperation agreement later that year, their first joint activity was the organization of an exposure visit to the Netherlands. Mr Samoei admits that this trip opened his eyes to the opportunities in dairy farming. Instead of focusing primarily on crop farming, he decided to spread his interests and improve his dairy stock. Out of the 200 cows that were grazing in the field, only 40 were lactating. Together they were producing less than 60 litres of milk per day on average, barely one and a half litres per cow. Disease incidence was high and most of the cows were old and non-productive. Around that time, KMDP had engaged two PUM experts from the Netherlands to visit and advise medium- and large-scale farmers in the North Rift region.

*'The PUM expert was so shocked; he said my 200 cows looked so skinny.'*

After returning from the exposure tour to the Netherlands, EDFA members were inspired to continue organizing training activities. The group started to organize training and field days with support from local and international KMDP dairy advisors. The training covered topics such as record keeping, fodder establishment, herd



The cow shed, reconstructed after receiving feedback from a consultant from The Friesian.



The cows eat freshly-cut grass; the record board keeps track of each cow.

management, and cow housing. This was done alongside farm visits by advisors to the individual farms selected for this support, training in the Practical Dairy Training Centres and exchange visits to EDFA farms. Mr Samoei, who had been attending these training sessions actively, started implementing what he had learned. Culling the unproductive cows reduced his herd from 200 to 60 cows. He also constructed a shed for the calves. Later, his cow shed was inspected by an international expert from The Friesian, who has been working for KMDP since 2014. This consultant advised him to modify the housing.

*'The Friesian consultant told us that we didn't have a cow shed, but a prison for cows.'*

The support and advice from both local experts and international consultants from The Friesian and PUM has focused on improving the management of dairy production in general through various trials on the farm. This has also contributed to increasing the capacity of the farm workers to implement good dairy practices. The farm receives frequent checks and close monitoring by the Friesian consultant, which helps the staff to become potential model farmers. Mr Samoei says he welcomes the consultant on his farm several times a week with great pleasure even though the consultant often challenges the farmer.

*'Sometimes, he even comes when we are milking. He doesn't tell us. Then he checks whether we are doing things right. If we don't, he comes and does it with us, to show us the right example.'*

### Two years of investments

Mr Samoei has made remarkable steps in the management of his dairy farm, especially in improving efficiency. He has expanded his cow shed for the growing herd. The modified cow shed now has two sections, separating heifers from lactating and dry cows. Currently, the farm labourers are milking the cows by hand, but Mr Samoei is building a mechanized milking parlour, which should make milking more efficient and improve the quality of the milk. In 2014, he built a young stock unit that provides adequate space for calves in groups of 0-3 months and 3-8 months. The farm optimizes growth of replacement (young) stock by trying to service all the heifers at 16 months latest, to realize a first calving age of 24 months. To achieve this, the farmer has to make sure his calves grow by 600-750 grams a day.

Mr Samoei formed ten paddocks to improve the management of pastures through fertilization and weed control. He has increased the production of maize for silage from five acres in 2012 to fifty acres in 2016. In 2015, he started experimenting with grass silage and harvested two grass crops by mid-2016. Mr Samoei states that his grass production has been successful and he wants to increase his fodder production with thirty acres of Rhodes grass. One of the PUM experts, specialized in soil and



A trainee was employed to assist in organizing the administration.



The farm has 50 acres under maize for silage.

fodder production, encouraged him to do a soil analysis to increase his yield of grass and other crops. After the analysis, Mr Samoei changed his fertilizer from DAP to NPK to reduce the acidity of the soil. He states that through the change in type and amount of fertilizer used, the yield of barley increased from 20 to 30 bags per acre. He is still growing barley for sale, but also started feeding barley to his cows. He understood from the training that he could mix barley as an energy source with sunflower and cotton seed cake as supplement protein sources in addition to the silage. The PUM expert also advised him on land preparation, maintenance of machinery, and tillage. After soil testing, Mr Samoei found out that lucerne could not perform well in his soil and therefore he decided to pilot high-protein grasses. Kikuyu grass was already on pilot by mid-2016.

In 2015, Mr Samoei participated in a second exposure visit to dairy farms in the Netherlands organized by EDFA and KMDP. This time, he focussed his learning on young stock management, record keeping, and dairy economics. He had been keeping records since 2014, but the exposure tour convinced him to upgrade his system. After visiting the Netherlands, he was supported by an international intern to upgrade to computer assisted data management and analysis. Mr Samoei has since embarked on cost-price calculations and started to monitor the growth of his young stock.

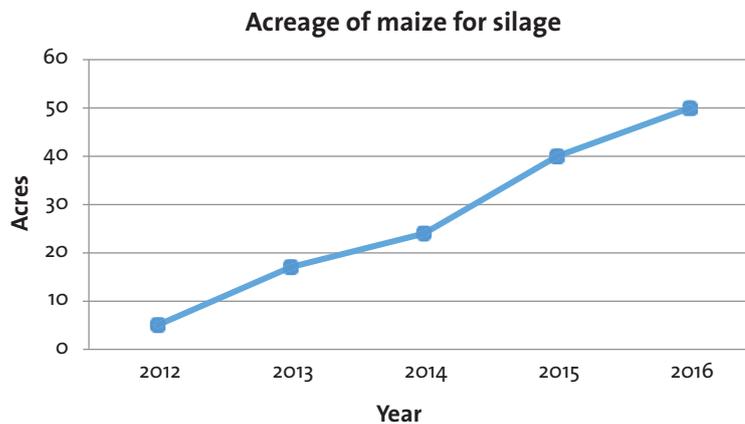


Purchased supplements help to feed the herd properly.

### Fulltime focus on dairy farming pays off

Early in 2016, Mr Samoei realized that most of his regular income came from milk production. He sells smaller volumes of milk to a school in the neighbourhood and to his workers at a fixed price, but the milk vendor in Eldoret town, where he sells most of his farm's milk, increased the purchase price from Ksh 25 per litre in 2012 up to an average of Ksh 40 per litre in early 2016 (a 60 percent increase in four years). This convinced him to gradually cease crop farming and to focus totally on dairy farming. Calculations showed that his cost price per litre of milk is Ksh 16. This rises to Ksh 32 if the investments in buildings, milking parlour, and accompanying equipment are included. To rationalise costs further, he reduced the number of employees from a total of 28 to only 15, four of whom focus solely on the dairy work. The records show that his 27 milking cows produced an average of 8400 litres in June 2016; of this amount 7100 litres were sold (85 percent). The average selling price was Ksh 30.41 per litre, leading to a total revenue of Ksh 215,911.00.

Mr Samoei has noticed that his milk production has stabilized at an average of 400 litres per day in both dry and rainy seasons. The production at the time of this documentation was lower than expected due to the high number of dry cows in relation to the milking cows, a scenario that stems from the initial culling. From the more than 220 acres of land that Mr Samoei is now using for dairy, 47 acres are grazing pastures and 108 acres are under feed crops. This includes 70 acres for maize, of which



50 acres will be used for silage and 20 for human consumption. Another significant acreage is barley, but this crop will be used purely as cow fodder. In addition to this, Mr Samoei has piloted planting of grass and other feed crops on small plots.

### Promising prospects

Mr Samoei has stated that he is happier with the dairy farm than with the crops due to the stability and predictability of the income. He believes that the risk of failure of dairy due to weather changes is much smaller compared with crops. With minimal investment, he has been able to increase his milk production from 60 litres in 2012 up to 250 litres from 20 cows in 2014 and up to 400 litres from 30 cows in early 2016. Samo Farm has gained a good reputation among North Rift farmers and currently serves as a demonstration farm used by KMDP to train farmers in and beyond the region.

Mr Samoei sees the immense support that his farm has received from various experts as having been very important. According to him, this has largely attributed to the improvements in his farm and to develop the farm's 'vision 2020'. Mr Samoei and the international consultant made a structured plan to define a five-year vision of the farm. In 2020 Mr Samoei plans to have a total of 500 cows by growing his own replacement stock and only buying some breeding stock. In September 2016, he expects to grow his herd size and milk production as 13 cows are expected to calve down around that time. The farmer also plans to invest in more machinery and to finish the installation of the milking parlour within the year 2016. All these steps are aimed at increasing overall farm efficiency and productivity. This is seen as a desirable spill over effect of KMDP support.

# Making good farms better

The story of developing a medium-scale farm in Karatina, Central region



Imani Farm.

Imani Farm is located in Ihwagi, Karatina, 130 kilometres North of Nairobi. The owner, Mr Maina, 'rediscovered' dairy farming as a profitable business more than ten years ago by increasing his herd size from three to 38 cattle on a four-acre piece of land. He also owns Imani Milk Café in Karatina town, which to date has been a profitable business. Over the past two years, Mr Maina's farm has been visited by KMDP dairy advisors from Perfometer Ltd and PUM. Mr Maina received valuable advice that has enabled him to make changes to his buildings and dairy operations to improve efficiency and profitability. Mr Maina's story is an example of the positive impact advisors can have when working with farmers.



Popular Imani Milk Café sells raw milk and lucrative processed products.

### The establishment of Imani Farm

Imani Farm is a well-managed farm. It is owned by Mr Maina Muthuma, a 'telephone farmer' who visits regularly and spends on average two days a week there, depending on the activities on the farm. At 47 years of age, Mr Maina says he is retired. He lives in Nairobi with his wife and two daughters where he also breeds dogs. He was born and raised in Nairobi by his father and visited his mother on her farm in Karatina during the holidays. This is where Mr Maina developed his interest in dairy farming. At that time, Mr Maina's father had Ayrshire and Guernsey cows, cattle breeds that were producing between five and ten litres a day due to poor dairy management practices. He was convinced that if his parents kept better breeds and improved animal husbandry practices, the cows would produce more milk.

*'I kept pushing my father to improve the farm. One day, he told me: 'You claim to have so much knowledge about cows, yet you don't even have one cow. Why can't you buy your own cow and practice all the things you tell me?''*

Motivated by his father's challenge, Mr Maina bought three cows and set up a dairy farm on one of their family properties. That's how his journey in dairy farming began.



The narrow silage pits result in less wastage; the challenge is to buy good quality feeds.

### The dairy farming journey

Since the start of his journey in dairy farming, Mr Maina has focused on implementing modern dairy practices. When he needs information on how to solve his problems on the farm, he consults advisors, the internet, input suppliers, service providers, and friends involved in dairy farming. His original plan was to produce between 50 and 100 litres of raw milk daily and to sell it through his shop in Karatina town. This approach changed when the market started demanding a wider range of milk products. Customers at the shop wanted cups of boiled milk, so the shop became a milk café. Then customers started asking for yoghurt in different flavours, Mala (a traditional cultured milk product), cakes, and even ugali (a dish made of maize flour) as an accompaniment. Mr Maina ventured into processing to make the requested value-added products for the Nairobi market, such as Greek yoghurt, quark, kefir, and buttermilk, but also needed to increase his milk production to meet the growing demand. He gradually increased his herd and milk volumes, but did this according to his own guiding principles: there had to be sufficient (quality and quantity of) services, feed, water, and housing space available for all cows on the farm and enough labourers to take care of them. Most importantly, there had to be a market for the extra milk produced. Mr Maina balanced the supply and demand for his milk and dairy products well. Imani's Milk Café is now a successful business and a popular meeting place for locals.

### The obstacles of a medium-scale farmer

The journey of expanding Imani Farm brought along challenges varying from feeding, housing, and supply of inputs. Currently, Mr Maina's main challenge is how to guarantee purchasing good quality feeds and minerals. He had encountered unscrupulous business people who buy quality feed and minerals from manufacturers, adulterate it, repackage it, and then sell it on to farmers as the original product. Mr Maina found a way to overcome this challenge by buying directly from a maize flour miller in the neighbouring district and by purchasing protein-rich ingredients, such as soya, cotton seed, and sunflower cakes from importers. He has now expanded his cow sheds to hold 60 cows. His third difficulty was finding contractors who were willing to cut the hay he grows on his other 15-acre farm in Nanyuki when it is at its optimum quality. Contractors are normally paid per hay bale. So, when grass is overgrown it generates more income for them. This year Mr Maina wants to pay the contractor a higher price per hay bale to be sure that his grass is harvested and baled at the point of optimal nutritional value.

### Learning within the country

Mr Maina is an avid self-learner, but he also attributes his steady farm improvements to the visits that his farm receives from various advisors. In 2014, Mr Maina met KMDP and Perfometer advisors at the Eastern and Southern Africa Dairy Association



Mr Maina consulting with a PUM dairy expert.

(ESADA) exhibition in Nairobi. Since then, local consultants from Perfometer Ltd have been visiting Imani Farm regularly and have advised Mr Maina and his staff on various dairy management issues. On their advice, for example, he raised the roof on his cow sheds to improve ventilation, opened up the milking parlour to improve lighting and reduce heat, and expanded pathways to improve the cow flow from the cubicles to the parlour. Mr Maina acknowledges that these experts have helped the farm to improve the quality of silage. He is now making his silage pits narrow and long, which makes compaction easy. This matches the feeding rate based on the herd size, thereby reducing bunker losses of maize silage. He also received advice to eliminate uncrushed grains from maize silage and to limit spoilage by reducing the amount of time that silage remained in bags before feeding. Advisors from PUM and Perfometer Ltd still visit Imani Farm to either use the farm as a training venue or to follow-up on the implementation of the advice provided.

### Learning overseas

In October 2015 Mr Maina was among the 11 medium-scale dairy farmers who were selected by KMDP to attend a two-week dairy management training in the Netherlands. Mr Maina said that the trip helped him to reach a higher level of farm productivity, because he was able to implement most of the advice provided during the training sessions. Each farmer paid his own ticket and visa, while KMDP and NABC facilitated the training process and accommodation. During these training sessions, the farmers learned how to increase their volume of quality feed by managing grass



Mr Maina learned to manage grasses after coming back from training in the Netherlands.



Imani Farm's most important asset: the young stock.

as a crop and using manure for fertilization. Mr Maina says that he learned from Dutch farmers that the quantity of feed he produces should be the deciding factor for his herd size. Furthermore, he learned how to manage young stock, a key factor for his future production potential.

*'I'm no longer excited about milk production only, because I was taught that problems with milk production could be seen in the records. The performance of my calves gives the true indication of the state of my farm; I improved the management of my calves so they can develop faster and I can use them to expand my herd or sell them for an extra income when they are fifteen months.'*

He further notes that his calves are now born weighing between 40 and 48 kilos and that they give birth to their own calves between 24 and 26 months of age: even according to Dutch standards, he has a well-managed farm (see box).

Mr Maina has taken on the role as peer trainer for other medium-scale dairy farmers. As a member of the Nyeri Chapter of the Medium-scale Farmer Forum (MFF), a forum established by Perfometer Ltd under the auspices of KMDP, Imani Farm hosts study group sessions. The MFF coordinates its own training courses and promotes peer learnings for its members. This study forum, as well as the visit to the Netherlands, has helped Mr Maina to increase his peer network as well as given him additional sources of skills and inputs.

### Accomplishments and future plans

Imani Farm is a progressive dairy farm with most of the good dairy farming practices well implemented (see box). The latest development is the contract between breeders and the Government Agency KAGRC who will supply bulls for semen. KAGRC now has four quality bulls at the station with a high breeding value. Currently, Mr Maina owns 30 healthy pedigree cows, of which 15 are lactating. The cows produce an average of 20 litres of milk per day, with a total milk production of approximately 300 litres per day. Currently, Imani Farm is an open learning centre that hosts other training events and delegations, even outside KMDP supported groups. The farm has hosted dairy trainees from Tanzania and other counties, due to the farm's ability to maintain good practices and Mr Maina's ability to articulate the farm's practice. Over 300 farmers have visited Imani Farm through KMDP so far. Mr Maina continues investing in his dairy farm based on the advice he receives and what the market demands. He uses the money generated by the dairy farm to make other investments. He says that, while he cannot tell when he will stop building up investments, his focus is now on how to overcome challenges by finding solutions and by continuously thinking of new ideas to expand the farm. For now, the telephone farmer is in an advanced stage of setting up a cottage industry to process all the products on his farm before packaging them for Nairobi niche markets. This makes him happy and helps him to stay focused. Mr Maina concludes:

'Investing in a medium-scale dairy farm is a journey full of ups and downs, but it is a really exciting journey. The ability to grow our own food, feed our own cows, produce our own milk, process and market our own value-added to products to a niche market in the Capital City, is a dream come true.'

#### Changes at Imani Farm

1. Calf rearing: grouping of calves, feeding, weighing, and taking Body Condition Score (BCS).
2. Feeding and nutrition improved due to increased capacity for fodder production.
3. Veterinary bills are low, as cows are healthy.
4. Value addition of produce has increased.
5. Cow shed modification to increase cow comfort.
6. Adjustments to silage bunkers.
7. Breeding of quality heifers increased the number of milking cows to 50.
8. Imani Farm has become a learning farm.



One of the well-fed cows is being milked.



## BUSINESS OPPORTUNITIES AND INNOVATIONS

The dairy sector in Kenya is vigorous and commercialising quickly. Farmers are adopting good practices and need different and better inputs and services than before, including marketing of milk. This has led to the formation of dairy farmer cooperative societies to collect, bulk and market members' milk production and to provide services. It also stimulates private input suppliers and service providers to invest in service delivery. This development fosters the dairy farmers' efforts to get to the next level. Despite this trend, lack of knowledge and capital often hinders farmers' efforts to improve their farms.

The first case study tells the story of Ndumberi Dairy Farmers' Cooperative Society in the Central region. The story is an example of what is needed to make a farmers' organization work, including the importance of good governance.

The last two stories tell about the experiences of two entrepreneurs who started new business models from scratch. These two companies not only lacked knowledge, but also capital for innovation investments. They have made good use of KMDP's Innovation Fund and technical advice. The story of Gogar Farm shows how, through innovation financing, a large-scale farm was able to pilot a business in making and selling silage. By riding on the networks of KMDP it saw further opportunities to engage in other commercial activities. The Nundoroto story shows how a Dutch social entrepreneur responded to the need of small, medium- and large-scale dairy farmers in the North Rift for quality maize silage. Nundoroto started the 'maize train' and introduced the concept of professional agricultural contracting services for the dairy sector in this part of Kenya.

# Getting the structure right

The story of the development of a dairy society in Kiambu County



Ndumberi Farmers' Cooperative Dairy Society.

One of the dairy societies supported by KMDP, the Ndumberi Dairy Farmers Cooperative Society, is located approximately 20 kilometres north of Nairobi. The story of this society shows how internal dynamics influence how a dairy society operates and functions and demonstrates what a society needs to do to overcome its challenges.

### Rights and obligations

Ndumberi Dairy Farmers Cooperative Society was founded around Kiambu town, back in 1963. The core business of the society was to collect, bulk, cool and market the milk on behalf of its members. The society started with approximately 100 members from Ndumberi, Tinganga, Riabai, and Kiambu towns. After more than 50 years, it has now become an organization with over 5,000 registered members, spread across various areas of Kiambu County.

Ndumberi member rules say that members must commit to supplying milk exclusively to the cooperative. Every member has one vote, and members are expected to participate in member activities that control the management of the dairy society, for example by attending annual general meetings. The day-to-day functioning of the cooperative is managed by fulltime employees and the supervision is carried out by the elected board of the Ndumberi society. Elections are held every three years. Members benefit from the collective services offered, which a farmer alone cannot access (see box).



Hay is purchased collectively to be sold on to member farmers.

### Bigger is not always better

In 2013, the management of the society was weak, but at the same time the management was keen to work with development organizations. That year, KMDP signed a tripartite agreement with the Ndumberi Dairy Society and Agriterra. While KMDP focused on developing an efficient extension and service delivery model, Agriterra was focusing on merging the Kiambaa and Ndumberi Dairy Societies to achieve adequate volumes to justify going into processing. SNV and Agriterra supported Ndumberi by offering training, exposure visits, and targeted advice during board sessions.

As an indicator of growth, the society increased the number of agro-vet stores from four to sixteen, to improve members' access to supplies. Management

then purchased a processing line for yoghurt and organized a credit arrangement with the supplier of the processing unit. On another front, the K-MAP programme (a hay and forage project implemented by TechnoServe), brought together the Ndumberi and Nyala Dairy Societies and supported them to form a joint venture to cultivate hay in Wiyumiririe, Laikipia County. The number of collection centres was increased from 16 to 32 to support increased milk volumes. The society also increased the number of staff to support the business expansion.

While all this was happening the milk processing company, Brookside Dairy, installed a 10,000 litre milk cooler at the Ting'ang'a centre. The society signed a partnership with Brookside, but when the latter lowered its buying milk price significantly, farmers sold part of their milk production to brokers at a relatively higher price, which affected the overall business projection.

#### Functions of a dairy society

1. Collection of milk twice a day from affiliated farmers
2. Regular payments to affiliated farmers
3. Dispatch the collected milk
4. Service to members:
  - a) Balanced cattle feed
  - b) Improved fodder seeds
  - c) Animal health care services
  - d) Breeding services
  - e) Patronage based portion of profits
5. Contribution to village development.



Outlet for yoghurt retail.



The agro-vet shop sells farm inputs through a check-off system.

The expansion resulted in a number of other challenges, primarily because most components lacked a thorough feasibility assessment. It was soon apparent that the operational controls and a monitoring system were not in place. Clerks in the agro-vet stores did not maintain proper accounts, employees mismanaged the processing unit, and there was no oversight on procurement. This all caused losses. After four years the processing unit's cash flow had deteriorated to such a degree that it was no longer possible to pay the milk suppliers as well as meeting other financial obligations. Collaboration with the K-MAP programme was the source of a large problem. The management board had approved the investment of Ksh 5 million into the project, which then strained resources for the core business - procuring and paying for milk. It was clear that while the expansion had brought additional income to the society, the additional turnover did not offset the extra costs. The net effect was a loss to the society that contributed to an overall decline in the business operation. On top of that, external factors like weather inconsistencies, lower milk prices offered by Brookside led to decline in milk intake. Between March and December 2015 the daily milk intake dropped from 16,000 litres to 13,000 litres. In fact, the society's original cooling tank was now perfectly adequate for the quantities of milk delivered. The work force that had been increased to cope with more work actually had less to do and this led to boredom and absenteeism.

During the expansion, Ndumberi Dairy Society had an inexperienced manager. As a result, most of the board decisions were implemented without question. In the Hay and Forage project, the Ndumberi Dairy Society did not seem to have a strategy in place on how to approach the project. The hay production site was over 200 kilometres from Ndumberi Dairy Society and, without irrigation, had been dry in the previous years, so that hay could only be harvested once a year or not at all; and investments were made in equipment that never got fully utilized.

*'This is one project that the current board feels they should never have gotten into.'*

### Cutting the losses

In 2015, the Ndumberi Dairy Society employed a new manager who was assisted by Agriterra and KMDP consultants to develop a transformational strategy. His first job was to write a strategic plan (to give the business a direction, including a vision and mission, see box) and a finance policy (to install and implement financial controls at the cooperative). The manager also evaluated the society's agro-vet shops, the processing unit, the partnership on Hay and Forage, the milk collection centres and routes, and the staffing. He discovered a lot of inefficiency and took steps to draw up a new strategy (see box).



The SACCO office is located right on the society's premises.

### Vision and Mission

#### Vision Statement

*'To be the winning dairy marketing society of choice to farmers and stakeholders.'*

#### Mission Statement

*'We exist to empower members through competitive marketing of dairy products and delivery of quality producer - focused services.'*

The implementation of a five-year strategy led to significant decisions. Firstly, six loss-making stores were closed. Secondly, the manager introduced control mechanisms and established targets for the processing unit. After this, the society managed to post positive returns from its processing plant, even when high maintenance costs were incurred. Thirdly, milk collection routes were streamlined and a number of collection centres were merged, which helped to reduce transport costs. Scales were placed in the vehicles and this reduced the number of graders needed. Fourthly, after evaluation of the partnership in the Hay and Forage project, Ndumberi opted out of the joint venture. Finally, the Annual General Meeting agreed to dispose of one vehicle. The new strategic plan aimed to reduce the milk sold to Brookside dairy by 15 percent, and to increase the price per litre for the farmer. Due to this, Brookside raised concerns over breach of contract and eventually pulled out the cooling tank. The society replaced it with a brand new Packo 10,000 litre cooling tank. The contract with Brookside ended and the society began to sell its milk to the informal market. The society also evaluated staff needs and dismissed 20 members who were seen not to support the on-going transformation while eight others were declared redundant. The society retained 68 of the original 98 staff members.

### Success factors for a dairy society

1. Good management
2. A clear strategy with vision bearers in the society who direct members towards its vision
3. Good organizational structure and communication, including policies and structures, both written and practiced
4. Integrity and transparency among leaders and towards its members
5. The ability of the board and management to take their responsibilities and execute their own tasks. Therefore the society needs qualified staff.



Ndumberi yoghurt is distributed to retailers in Nairobi.

### Back to basics

Ndumberi society was in debt to suppliers and various financial institutions. To make a fresh start, the management negotiated with the creditors to carry on with the business relationship. Agreements were made and gradually the older debts were paid off. During their negotiations, the financial institutions, among them a Savings and Credit Cooperative Organization (SACCO) and a bank, restructured the terms of the loan. The management committee was supportive, especially under the leadership of the new chairman. The society then focused on long term goals and decisions made were in line with these goals. As a way of managing overheads, the board members' fees were cut as well as the number of meetings. This was collectively agreed as a measure to revive the cooperative business. The manager admitted that it was the 'panic' that helped the society to survive the fall.

*'All parties realized that the cooperative was near death and any idea to bring a solution was welcome.'*

The processing plant was still making a loss in 2015 (Ksh 44,068), though the loss was much smaller than in 2014 (Ksh 3.4 million). This positive step was mainly due to the introduction of controls and reduction of overheads by reduction of staff and revision of board expenses. The volume of processed yoghurt increased from 300 litres to 500 litres per day within two years. Ndumberi Dairy Society has found its way back to operating its core business.

### New perspectives

The society has installed a new boiler and plans to expand the production of fresh pasteurized milk. The society is now processing 2,500 litres of milk per day and is in the process of buying another pasteurizer. The management intends to pasteurize and sell 10,000 litres of milk per day by the end of 2016. The society also plans to maintain a share in the raw milk market. Currently, the main challenge is the low milk supply from its members. The management has now started to collaborate with other cooperatives within Kiambu, to explore increased market share for pasteurized milk. The next step will be to fully invest in value addition and re-brand and re-launch their products to better position them in the market. The management is aware that it should increase support to its supplying farmers, so that they can increase their production per farm and in effect boost supplies. Another prospective strategy is to engage more youth in dairy activities, and to increase training of the board and staff to help them run the organization in a professional way. With the current manager, the dairy society is making a come-back, ensuring that its members will be served as they should be.

# Church pastor turns entrepreneur

The story of a Dutch social entrepreneur starting an agricultural contracting service company in the North Rift region



Nundoroto Farm.

Nundoroto Farm's enterprise division has responded to an increasing demand by dairy farmers in their district who need support with land preparation through to maize harvesting and ensiling. Nundoroto started by leasing out machinery to smallholders. Mr Van den Ham saw the potential to set up professional agricultural contracting services and applied for a financial contribution from KMDP's innovation fund early in 2015. The story of Nundoroto Farm Company shows how this market-driven business transformation has resulted in a win-win situation: profitability for the company and increased yield and quality of silage for its farmer clients.



Nundoroto's first tractor, purchased in 2006.

### From little seeds ...

'Nundoroto' means 'water' in Sirikwa, a Maasai-related language. It is the old name of the river that flows through the plateau near the Kipsinende area.

Around the beginning of this century, Reverend Van den Ham and his family started a farm in Plateau, approximately 15 kilometres southeast of Eldoret. The owner appointed Mrs. Margaret Kayeli as the operational manager of the farm. She had been working with the Van den Ham family since their arrival in Kenya in 1992. The Reverend had difficulty leasing tractors to plough his land so, in 2006, he decided to buy a small tractor (a Massey Ferguson 240). Soon, smallholders from the neighbourhood started to ask Rev. van den Ham for permission to use his tractor in their farms. He allowed the farmers to use the machine, which helped the farmers to plant their crops in time and to increase their production up to six-fold. Within a short time, the Reverend saw that demand for the tractor exceeded its availability. Because of his desire to help his neighbours, the farm bought another tractor with a higher capacity. With support from the Dutch Foundation for Christian Aid in Kenya, Nundoroto Farm purchased even more farm equipment. Neighbouring farmers could now lease machinery to plant, fertilize and harvest their crops.

*'Nundoroto' means 'water' in Sirikwa, a Maasai-related language. It is the old name of the river that flows through the plateau near the Kipsinende area.*



Nundoroto's sowing machine.

### ... do great oaks grow

The smallholder farmers experienced an increase in production per acre. Their growth caused them in turn to require even more help from Nundoroto as an agricultural contractor. In 2010, Nundoroto Farm Company developed into a professional agricultural contracting company with the aim to offer the highest quality services in terms of agricultural machinery and advice to smallholders. In 2013 silage-making was added to the services offered. Medium and large-scale farmers also heard about the services offered by Nundoroto, which now went beyond leasing equipment and

#### Components of the maize train

- Contracts in place with client farmers
- Ploughing, harrowing and planting of certified seed
- Soil analysis, fertilisation advice
- Crop protection with boom sprayers
- Harvest with forage harvesters
- Transport to silage pit
- Silage pit design, supply of plastic, silage-making and coverage
- Machine maintenance and repairs.



The maize train.



The grass train.

included advisory services on mechanized labour as well. The services that Nundoroto offers are attractive due to fair costing and quality of work. Contracting is becoming a more feasible option for the medium to large-scale farmers, because they no longer need to incur the high costs involved in purchasing machinery. For activities that are carried out once a year the farmers prefer to lease rather than to buy, so they can eliminate the costs that come with under-utilized machinery.

At first, Nundoroto did not have the capacity to offer services to medium and large-scale farmers, because the two-row reverse driven forage harvester and zero tillage equipment could only manage small plots. Nundoroto then realized that it needed to invest in higher capacity machines, especially for silage-making, if it were to serve the medium and large-scale farmer segment.

The link between KMDP and Nundoroto Farm Company was made in 2014 when KMDP consultants came across a smallholder who was using Nundoroto's machinery. The consultants visited Nundoroto and discussed, among other things, the challenges that Nundoroto had in serving the medium and large-scale farmers. KMDP suggested that Nundoroto consider leasing the four-row forage harvester from Simam farm, a farm just a few kilometres away. Simam farm only used the machine for its own fields. Through Nundoroto, the machine could help more farmers from around the area.

### Nundoroto innovation project

#### Project aim and investments

Next to improving the contracting services provided by the farm, the aim of the Nundoroto Farm Services Project was to increase the income of smallholder farmers. These farmers (owning up to five acres of land and earning around \$1 a day) form the majority of farmers in this area, but the sizes of their farms do not allow them to get their own tractors and implements.

#### Innovation fund investment

The main investment was a self-propelled John Deere six-row maize harvester. The machine has a rotating Kemper head that can cut wheat, sorghum, and oats, Napier grass, and a grass head for mowing grass. The machine has a crusher to chop mature maize with high starch content to result in optimal nutritional value.

#### Project financing

Total project budget:	€ 150,000
KMDP contribution:	€ 50,000
Nundoroto contribution:	€ 100,000

*'From that moment, we were able to also serve medium and large-scale farmers. We lease the machine from them [Simam farm] and farmers pay us for our services. We have been experiencing a very good collaboration with the owners of Simam farm'.*

In 2015 Nundoroto carried out a demonstration with Simam's four-row forage harvester. Hundreds of farmers were present for the two field days where the demonstration of the maize train was carried out (see box). Afterwards farmers from other areas of North Rift region started requesting the machine. The demand for the machine increased and Nundoroto's diary was overbooked.

Unfortunately, the four-row forage harvester broke down during operations. The operators and mechanics employed by Nundoroto were familiar with servicing most equipment due to the one-week training from PUM experts they had attended, but lacked experience in repairing the 'new' four-row forage harvester. Moreover, spare parts were not available in Kenya. This caused problems on the farms by delaying the planting or harvesting of crops. Nundoroto realized it needed a second six-row forage harvester, a stock of spare parts and better trained mechanics. Early in 2015 Nundoroto applied for a subsidy from KMDP's innovation fund for this purpose (see box). A financial contribution was received that August. Nundoroto bought a second six-row forage harvester and spare parts for the machines from a company in the Netherlands. These are currently being shipped. Nundoroto has also bought plastic sheets for silage pits and established a maize demo for training (small-scale) farmers. The company has trained more than a hundred farmers on the importance of proper planting and timely harvesting of maize so far. Later in 2015, Nundoroto sent three of its mechanics to the Netherlands for skill training.

**The number of acreages and customers covered by Nundoroto FC between January and May 2016**

Activity	Acreages	Customers
Spraying	68	10
Soil breaking	27.2	14
Disc ploughing	143.4	41
Harrowing	613.3	106
Maize planting	538.9	73
Shredder	4	1
Mould board	229.8	31
Chisel	14.4	4
Semi-breaking	8.3	4

**Price list per acre**

Mould board ploughing	Ksh	3200
Disk ploughing	Ksh	2700
Harrowing	Ksh	1800
Planting	Ksh	1200
Spraying	Ksh	800
Top dressing	Ksh	800



The field day drew a lot of interest from farmers from the region.

### A sturdy operation

Currently, Nundoroto offers its services to all categories of farmers in the North Rift region (see table). Farmers have learnt about the arrival of a second harvester, and made calls to book the equipment. In terms of equipment, Nundoroto now has at least two complete sets as well as five tractors. This allows them to work on more than one farm at the same time. Nundoroto employs ten permanent labourers (including four women) and eleven casual labourers. It offers training to its workers to improve their skills. The manager, Mrs Kaveli, explains that the company deliberately promotes employment for young people. She also explained that although it is a non-profit organization, it covers all the operational costs like maintenance of machinery; fuel and salaries are fully offset from the payments received from farmers. One of the KMDP consultants explained that while Nundoroto has slightly higher prices for its services than its competitors (see box), the quality of its services is much better. Nundoroto has proven to be professional in its practice and timely from start to finish. In addition, it offers advice on seeds (type and use), fertilizer selection, and - application.

### Promising future

Nundoroto uses a business model that assures that its investments respond to market needs. This is a growing model that is commercially sound and sustainable. With this approach, Nundoroto sees a promising future for its agricultural contracting services. The company plans to buy more machinery, especially equipment for grass ensiling. It also plans to offer raw materials like seeds and fertilizers, with the aim of diversifying, to further improve its professionalism, and to scale-up its service delivery system. Another goal is to start a 'fodder practical training centre'. This service is not only intended for farmers, but also for mechanics and operators who will be trained on land preparation, planting, crop protection, harvesting, and various methods of ensiling, among other things. The owner of Nundoroto is now based in the Netherlands and visits Nundoroto about four or five times in a year. The management of the company is left entirely in the hands of the Kenyan manager. The owner (with useful connections in The Netherlands) and the manager (with her connections in Kenya) continue to work side-by-side to reach Nundoroto's aims.

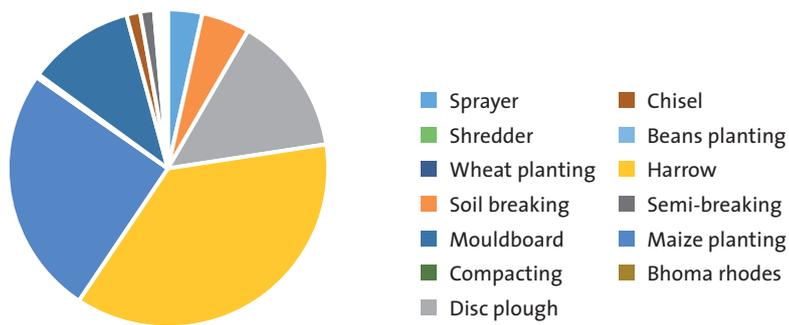


The John Deere 6850 harvester arrives at last!



The maize train and related practices result in excellent quality silage.

**Services provided by Nundoroto**  
January - May 2016



# Quality breeds for better production

The story of an innovative large scale dairy operation in Rongai, Nakuru County



Mr Hamish Grant, Gogar Farm.

Gogar Farm was established over a century ago and since then has been contributing to the development of the dairy sector in Kenya. Initially operating solely as a large-scale dairy farm, the farm has recently introduced business activities that address two major bottlenecks in the Kenyan dairy sector. It is fast-tracking the genetic improvement of dairy cattle and the supply of young stock, and it is responding to the large demand for silage to address fodder shortages in the dry season. The latter was made possible due to KMDP's innovation fund. Read the story about Gogar Farm to see why the farm decided to venture into commercial silage-making, how they have been operating, and how the market is reacting to this new business idea.



Pure bred Friesian Holstein heifers imported from the Netherlands.

### Quality and quantity can go together

Gogar Farm was founded by an elite group of aristocrats in 1915. Currently it is a 100 percent Kenyan family-owned mixed farm. The owner is Hamish Grant, who is the farm's managing director and majority shareholder. The farm is situated in Rongai, near the Salgaa business centre on the Nakuru-Eldoret highway, about 30 kilometres northwest of Nakuru. In the past, Gogar Farm played a leading role in introducing the Ayrshire cattle breed into Kenya. After decades of buying and selling land, the farm currently covers over 3,000 acres. Most of the land is used for grazing and hay production, while the rest is used for maize cropping and farm buildings. Part of the maize crop is for human consumption and the remainder for producing 3,000 tonnes of silage annually. The farm keeps 800 dairy cows, including a large herd of young stock that is reared to sell as in-calf heifers.

### Not just a farm

Gogar Farm has been focusing on dairy for a long time. Since early 2016, the company has been selling its milk to Bio Foods Ltd in Nairobi at an average production of 4,500 litres per day. Bio Foods is a relatively small processor that buys milk based on strict quality parameters and provides high quality dairy products (such as milk and yoghurts) to the high-end market.

To supply Bio Foods with sufficient milk, Gogar Farm needs to buy extra milk from farmers in the area. This has made them aware of the challenges small-scale dairy farmers face in maintaining a stable year-round production. Farmers in Kenya find it a challenge to get cattle with good genes, as the market is failing to supply good stock.



The farm produces maize silage way in excess of its own needs

Not only that, but these farmers often face a shortage of (quality) fodder to feed their cows during the dry season. Small-scale farmers, who mostly depend on rain-fed fodder production and have limited land to grow fodder, are especially vulnerable to difficulties in sustaining year-round milk production levels. This is compounded by the fact that hay for sale is usually of poor quality and is sold at prices that far exceed the poor nutritional value of the product.

Gogar Farm decided to respond to the demand for good stock and quality fodder. Firstly, the Farm started to organize the importing of quality breeds. Secondly, the owner came up with a plan to use a part of the land to grow maize and package it as silage and to grow grass for hay, both for sale to smallholders. This was designed to help overcome the two challenges that contribute to the irregular milk supply and at the same time boost Gogar's own business.

### Getting quality breeding stock

When Gogar Farm's owner learned about SNV's KMDP in 2013, the owner decided to contact SNV and use its network to organize the importation of high producing breeds in 2015. In both 2015 and 2016, Gogar Farm managed to import 450 heifer calves from Dekker – a company in the Netherlands. The cows are first kept on the farm to acclimatize them to local conditions. They are then inseminated with sexed semen so buyers get a 90 percent chance of a heifer calf. These quality in-calf heifers are sold to farms all over East Africa. Gogar Farm has specialized in breeding and is now one of the top breeding farms in Kenya.

### Venture into commercial fodder production

Mr Hamish decided to step into the market for commercial fodder supply as well. The farm has received support from KMDP's 'Commercial Fodder Producers' programme, through which it still receives technical assistance for planting large quantities of fodder. In 2015, the Farm was able to grow over 3,000 tonnes of maize for silage. After establishing the fodder production, Mr Hamish requested KMDP's assistance to implement his new business idea of packaging silage. KMDP consultants visited Gogar Farm, discussed the owner's business plan and helped him to put together a well-argued proposal to KMDP's Innovation Fund. In 2014, Gogar Farm received 50 percent co-funding from KMDP's Innovation Fund. The Farm used the EUR 35,000 to import machinery from China to carry out a pilot in 2015. The owner bought a pelletizer for forage-based pellets, a maize-silage bailer and a packaging machine. The farm now packs and seals maize silage in 50 and 80 kilogram briquettes and in pellets. The relatively small-sized briquettes are especially designed for smallholder farmers – when they bring milk to the market in cans on a bicycle, they will be able to return with one bale for every empty can. Maize briquettes can be either picked up at the farm or are delivered, whichever suits the buyer best. The process is fully mechanized and controlled to ensure high yields per acre, proper chopping, quick harvesting and ensiling, and adequate compaction. The machines enable Gogar Farm to supply small- and medium-scaled dairy farmers with high quality feed. Fodder samples are taken to the Netherlands for analysis.



The packaging machine that produces maize silage briquettes.



The maize train and related practices result in excellent quality silage

### A good idea is worth spreading

Over the past three to four years Gogar Farm has built strong relationships with the Dutch dairy sector, which greatly assisted in developing its two business models with technical advice and business partnerships. Gogar Farm's breeding model has now been replicated by other companies such as Bles Dairies East Africa Ltd, a subsidiary of Bles Dairies Group BV from Leeuwarden in the Netherlands. The breeding model has been important in addressing the high demand for pedigree cows in Kenya. It has also played a role in preventing ill-planned heifer imports from the region and sales to farms that are not prepared and equipped to properly care for the animals. Gogar's business venture selling plastic bags of maize silage, made possible by the large-scale fodder production, has increased interest and demand from dairy smallholders. In 2015 the pilot stage was completed successfully and in 2016 the demand increased with orders of ten to 15 tonnes of silage per week.

The new fodder activities are addressing the fodder gap in the market, especially for smallholders who often have insufficient land size to grow their own fodder crops. It is very competitive vis-à-vis concentrate feed and especially hay. Mr Hamish Grant explains that:

*'Almost every farmer who bought the product has come back for more, so demand is rising fast. The product can easily compete with hay in the market as it is of superior quality and offers much better value for money.'*

The project is scalable and a number of investors in other parts of the country – in collaboration with KMDP - are currently exploring the potential and considering replication of the concept with machinery and equipment that is fully automated. This also includes the use of different technologies aimed at fodder supply to medium and large-scale farmers, including so-called TMR (Total Mixed Ration). Seeing the large demand for quality fodder in the market, Gogar Farm is considering an investment in commercial lucerne production using a 100-acre pivot irrigation scheme. Lucerne is a high-protein fodder crop that can be baled as hay or can be pelletized. A comprehensive and viable business plan has been developed by Gogar Farm that foresees further collaboration with KMDP by mobilizing technical advice and providing connections to the marketplace.



Flyer advertizing the maize briquettes.

# SNV and the Kenya Market-led Dairy Programme (KMDP)

## An overview

### What is SNV?

SNV Netherlands Development Organisation (SNV) is an international not-for-profit development organization that provides capacity development services to nearly 2,500 organizations in over 36 countries worldwide. SNV collaborates with stakeholders at different levels in agricultural value chains, with the objective to enhance competitiveness, incomes and employment by inclusion of small and medium-sized farmers and SMEs.

In Eastern and Southern Africa, SNV has programmes in Ethiopia, Kenya, South Sudan, Uganda, Tanzania, Rwanda, Zambia, Zimbabwe and Mozambique.

In Kenya, SNV focuses on water and sanitation, renewable energy, horticulture, extensive livestock and dairy. In the dairy sector SNV is implementing the Kenya Market-led Dairy Programme funded by the Embassy of the Kingdom of the Netherlands in Nairobi.

### The dairy sector in Kenya

Kenya's dairy industry is private-sector driven. It is the largest agricultural sub-sector and contributes 4% to GDP (KDB, MoALF 2012). The sector shows high growth figures for marketed milk and investments by farmers, dairy societies and processors.

About 80 percent of Kenya's dairy milk production (3.8 billion litres KNBS 2009 census) is produced by smallholders. However, there is a fast growing segment of medium scale dairy farmers, often so-called telephone farmers, with fully commercial and mechanised dairy production.

Currently the sector provides income and employment to approximately one million people, including farm household members and those involved in support services, input and service provision, processing and marketing. About 30 percent of the milk sold is processed, which implies existence of a large raw milk market.

According to the KDB website, in 2016 Kenya had 23 registered and operational milk processors. Together they processed in 2015 about 625 million litres of milk (KDB, 2016). Brookside Dairy, NKCC, Githunguri, Meru Union, and Sameer/Daima together account for 85% of this.

In Kenya the dairy industry's growth and competitiveness are constrained by high cost price and low quality of raw milk. This is due to amongst others a huge knowledge and skills gap in dairy production, sub-standard service provision and input supply, poor handling and storage in the milk collection chain, high fragmentation in marketing and lack of inclusive business models. Low quality of feeds and fresh and preserved fodder is one of the key bottlenecks.

## The Kenya Market-led Dairy Programme

SNV's work in the Kenyan dairy sector is through the Kenya Market-led Dairy Programme (KMDP). KMDP is funded by the Embassy of the Kingdom of the Netherlands in Nairobi. KMDP-I runs from 1<sup>st</sup> July 2012 – 31<sup>st</sup> December 2016 and KMDP-II covers the period 1<sup>st</sup> October 2016 – 30<sup>th</sup> June 2019.

### KMDP's approach

The programme works at all levels with stakeholders and partners who aim to enhance efficiency, productivity and profitability of the industry. KMDP has partnered with smallholder-owned dairy societies, medium and large scale dairy farmers, commercial fodder producers, milk processors, training institutions, service providers and input suppliers, financial institutions and investors - both local and international. These partnerships are structured around two pillars:

#### **Pillar 1: Promoting efficient and competitive smallholder supply chains**

To achieve this goal, KMDP works with milk processors and farmer-owned dairy societies or companies, also referred to as milk Collection and Bulking Enterprises (CBEs), willing to develop an inclusive business model, by investing in training & extension services (T&E), feed and fodder, improved input and service provision, and milk quality. Input suppliers and service provider are linked to CBEs for members' training and marketing of products and services. In the smallholder dairy value chain KMDP supports 19 farmer-owned CBEs and two processors (Meru Union and Happy Cow). Key interventions are:

- **Management and governance:** training of Boards, Management, and operational staff, including the preparation of strategic plans.
- **Farmer Training & Extension:** stimulating and facilitating dairy societies and processors to set up and equip in-house Farmer Training & Extension (T&E) Units, collectively paid by the milk suppliers.
- **Feed and fodder:** training on feeding, feed rationing, fodder establishment, and preservation. The latter either on-farm or by facilitating linkages to Commercial Fodder Producers and agricultural contractors or service providers.
- **Milk quality:** Training of farmers, milk graders, and transporters in clean milk handling. Processor Happy Cow Ltd is piloting a milk quality tracking and tracing and quality based milk payment pilot with two CBEs, co-financed by KMDP.
- **Linkages with input suppliers and service providers:** promoting business-to-business linkages between CBEs and credible input suppliers and service providers, including financial institutions and training centres.

## **Pillar 2: Addressing systemic issues and innovation**

Interventions under this pillar are targeting stakeholders in the dairy industry who are best placed, willing and able to address systemic issues that hamper sector growth, through piloting innovations and best practice solutions. Important systemic issues are access to quality feed/fodder, milk quality, the skills and knowledge gap, sector transitioning (medium scale farmer segment), innovation, international exposure, and sector governance.

Because smallholders often lack the ability (knowledge, resources) to innovate and invest, KMDP engages with other stakeholders in the sector, and at different levels and entry points. In doing so, the changes instigated by interventions at these other levels are expected to eventually also benefit smallholders, in terms of an enhanced enabling environment, more inclusiveness in the supply chain and the development of a more robust dairy service infrastructure.

KMDP facilitates the following interventions under this pillar:

- **Feed and fodder:** KMDP works with commercial fodder producers, agricultural contractors (maize and grass train) and medium scale farmers to help close the fodder gap. In addition, a project for vacuum- packed maize silage in 50 kg bags was implemented with help of KMDP's Innovation Fund.
- **Milk quality:** Quality Based Milk Payment pilot project with Happy Cow Ltd (see above) and policy influencing.
- **Practical Training and Vocational Skills Development (VOSD):** Here KMDP supports Practical Dairy Training Centres, midlevel colleges and dairy advisory services (DAS) through linking them to international experts and institutions, such as PUM/Netherlands Senior Experts, Dairy Training Centre and Cow Signals.
- **Sector transitioning:** Medium Scale Farmer model (MSF). The emergence of MSFs, many of whom are so-called telephone farmers, plays an important role in sector transitioning. MSFs have the ability to invest in innovations, demonstrate best practices, and provide critical mass for the development of an effective dairy infrastructure with quality services, input suppliers and investors. They are also key in addressing the issue of food security for a growing urban population. KMDP supports MSF forums in accessing/sharing best practices, to develop innovative business models, to engage in agricultural contracting services and in training and demonstration (through PDTs), and to lobby for good policies for the benefit of the entire sector. This segment of professional dairy farmers will also establish business linkages with smallholders through milk bulking, sales of fodder and heifers, and opening their farms for training and demonstration programmes.

- **Policy:** KMDP engages with policy and opinion makers to identify or address policies constraining the growth and competitiveness of the sector, in particular in relation to practical training, feed and fodder and milk quality.
- **International business linkages and partnerships:** KMDP promotes and facilitates business linkages between Kenyan, Dutch and other international dairy sector players. International thinking about development cooperation is shifting from Aid to Trade. KMDP therefore facilitates international companies that wish to contribute to the Kenya dairy sector – rather than merely exploit it - through their products and services. It also assists local dairy stakeholders who wish to link up with international input suppliers and service providers, or who want to organize an overseas study tour.

This agenda is facilitated by KMDP's Innovation Fund. The Fund helps fast-track investments in partnerships and innovations by co-funding of technical expertise and hardware. Companies that have benefited from the Innovation Fund are amongst others: Happy Cow Ltd, Uniform Agri (farm recording software), Bles Daries (young stock and genetics), Nundoroto Farm Company (agricultural contracting services), Dairy Training Centre (E-Learning Platform), Cow Signals/Roodbont (East African Cow Signals Handbooks), Lewa Practical Dairy Training Centre.

## Short forms, abbreviations and definitions

AI	Artificial Insemination
CBE	Collection and Bulking Enterprise
EDFA	Eldoret Dairy Farmers Association
KDB	Kenya Dairy Board
KMDP	Kenya Market-led Dairy Programme
KNBS	Kenya National Bureau of Statistics
Ksh	Kenyan shilling
MCDFCU	Meru Central Dairy Farmers Cooperative Union
MFF	Medium-scale Dairy Farmer Forum
MoALF	Ministry of Agriculture, Livestock and Fisheries
NGO	Non-governmental organization
PDTC	Practical Dairy Training Centre
Perfometer	Perfometer Agribusiness is a company offering advisory services for the agricultural sector in Kenya with a focus on dairy. Perfometer implements part of KMDP programme based on a services agreement with SNV Kenya. <a href="http://perfometer.org/">http://perfometer.org/</a>
PUM	PUM - Netherlands Senior Experts Programme - <a href="http://www.pum.nl">www.pum.nl</a>
SACCO	Savings and Credit Cooperative Organization
SNV	SNV – a Dutch development organization
SPE	Service Providers Enterprise
Telephone farmer	An absentee farm or land owner, usually engaged in off-farm employment/business operations, whose farm is run by a farm manager and support staff. The telephone farmer visits his/her farm occasionally and makes decisions and instructs the farm manager 'on the phone'.





# Dairy matters

## Inspiring stories on dairy development in Kenya

The Kenya Market-led Dairy Programme (KMDP) is being implemented by SNV and partners in Kenya. It is funded by the Embassy of the Kingdom of the Netherlands in Nairobi. The positive impact of this programme on the sector has been described in various reports, but the personal stories of the people involved is the best testimony of the real effect of the programme in practice. This book introduces 18 of these farmers, farmer cooperatives and companies to illustrate KMDP's impact in the field. These inspirational stories trace the successes and struggles that have led to changes in attitudes and significant improvements in management practices on dairy farms in different regions in Kenya. After all, development is not about programmes, but about people.



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