



1.7 Kenyan smallholders improving benefits from milk production

MARIA J. RESTREPO, JOSEPH NDUNG'U, MESHACK MWAURA, MARGARETA A. LELEA and BRIGITTE KAUFMANN

Introduction

As part of a multi-stakeholder research project, two smallholder farmer groups in Nakuru County, Kenya, worked together to develop technical and organizational innovations to increase the benefits from milk production. As a prerequisite for this work, farmers, facilitators and researchers first reached a common understanding of the causes and extent of the problems they wanted to solve. With this solid foundation, farmers could then establish new structures and practices that met their objectives.

Dairy production in Kenya is dominated by smallholder farmers, who rely on their cows (or cow) for both household nutrition and income. Around one million farmers contribute about 70% of gross marketed production (Muriuki 2011). Smallholder dairy production is typically part of mixed crop-livestock farming systems with low external inputs. Access to inputs is constrained by poor infrastructure and by farmers' low cash reserves. In Nakuru County, smallholders usually keep 1 to 3 crossbred cows, and generally feed them with napier grass, crop residues (maize stalks, bean and pea stubble, carrot greens, etc.) and weeds. Lactation periods vary between 7 and 24 months, as cows may continue to be milked even without conceiving. Some milk is consumed at home, but most is sold.



AS PART OF A COLLABORATIVE LEARNING APPROACH, FARMERS THEMSELVES ARE CO-DEVELOPING BOTH ORGANIZATIONAL AND TECHNICAL INNOVATIONS.

Average milk yields per cow in the Nakuru area are less than 7 kg per day (with a range of 4 to 11 kg/cow/day). Average sales from the 138 farms surveyed ranged from 4 to 14 kg of milk per day. Cattle manure is also valued for its use in crop fields. Calves are sold, and represent an important source of family income; this helps to pay school fees and meet other regular financial demands. Milk production for important to household liquidity, as

Maria J. Restrepo works with farmer groups in Nakuru County, Kenya as part of her doctoral research, and is affiliated with the German Institute for Tropical and Subtropical Agriculture (DITSL), Witzenhausen, Germany; **Joseph Ndung'u** is chairperson of the Mukinduri Dairy Self-Help Group; **Meshack Mwaura** is chairperson of Lare Livelihoods Improvement CBO; **Margareta A. Lelea** is a post-doctoral researcher; and **Brigitte Kaufmann** is associate professor at the University of Hohenheim, Stuttgart, Germany, and leads DITSL's research section on Social Ecology and Transdisciplinary Research.

cash from sales comes in daily. In addition, cows are a status symbol that demonstrates family prosperity.

From individual problems to “how can we solve them together?”

During the rains there is ample fodder, but in the dry period from January to March there is not enough fodder, and farmers can spend up to six hours a day collecting it. In the rainy season, milk production increases to the point that there is an oversupply. These cyclical patterns of rainfall, fodder and milk production have an impact on price. Forgone benefits are caused by the difference between potential and actual milk yield, mostly during the dry season, and occasional rejection of milk by dairies during the rainy season due to low milk density (i.e., it is low in protein and high in fat).

The cows could produce more milk, but due to problems with feeding, health and other issues, the actual yields are below potential, especially in the dry season. One group member, Lydia Wanjeri of Mukinduri said, “during the dry season when I see the high milk prices, but my cow is producing only one or two cups a day, I just want to cry.” Lydia’s neighbour Francis Kiruka adds, “Those [families with cows that are] producing milk during the dry period are happy, as the family can then eat *ugali* [the traditional maize-based dish] with milk. There are no other sources of food on the farm at that time and it is expensive to buy from outside, while at the same time, you can sell the surplus milk at a good price.”

The dry season is a time when farm-related income is low, and there are fewer opportunities for off-farm casual labour. During the rainy season, fodder is abundant and milk production exceeds demand, but the milk is low in protein and high in fat. This is a possible explanation for rejection by dairies during the rainy season.

In the context of these problems, smallholder dairy farmers in Mukinduri and Lare, 30–50 km from the city of Nakuru, came up with the idea of collective marketing to improve their returns from milk production. From this idea, the Mukinduri Dairy Self-Help Group and the Lare Livelihoods

Improvement community-based organization were born. Before farmers could attract a higher-value market, they first needed to guarantee a continuous supply of milk throughout the year, improve milk quality, and mature as a group to ensure accountability.

Market access is especially difficult in Lare because of the lack of paved roads. In Mukinduri, farmers have more options because of their proximity to the settlement of Mau Narok and to a road used by several milk transporters. Nevertheless, farmers still face difficulties when selling in both informal and formal markets. With informal markets, payment delays are common due to the uncertainty of collection times, and payments are not always guaranteed because some small-scale traders are less than honest.



Farmers who sell milk in formal markets also face problems. When milk volumes exceed processing capacities during peak production in the rainy season, farmers face higher rejection rates from dairies; this rejection is often unjustified. Through a collaborative learning approach co-developed with farmers in both groups, they can now ensure a continuous supply of high-quality milk, and can negotiate for higher milk prices while simultaneously guaranteeing the reliability of delivery and payment.



Learning together: a farmer-to-farmer exchange

To help group members arrive at a common understanding of the problems and possible solutions, they organized several farmer-to-farmer exchange sessions. During these sessions, group members and other farmers shared experiences at the farm level and their perspectives on and knowledge of how to improve milk quality and buffer the effects of seasonality and different feeding strategies. Fieldwork allowed for the recognition of innovative smallholder farmers in the area who applied low-input methods and who have a deep understanding the constraints, challenges and restrictions

faced by group members. Afterwards, some of these innovative farmers facilitated exchange sessions where they shared experiences and knowledge with other members and other farmers in the area.

Innovative approaches to buffer seasonality and improve milk quality

Group members decided to test two new approaches: making silage (stored fodder), and planting fodder crops. As John Kihara Mbugua from Lare said, "Because we have a cow, the best thing to do is to start improving the way we are feeding it." Improvements in feeding resulted in corresponding improvements in milk quantity, animal health and fertility. And depending on how feeding is approached, a more nutritious diet can be possible even while reducing workloads.

Two smallholder farmers from Lare, Joseph Chege and Benjamin Mbutia Gacheche, facilitated farmer-to-farmer exchanges. Together, farmers planted and tested new fodder species, three different ways of making silage (pit, above-ground and tube), and the use of locally available materials (maize, sorghum and maize with napier grass). Sessions were organized where farmers worked together to plant lucerne (*Medicago sativa*, or alfalfa), oats and sorghum. Farmers learned how to plant and harvest these new fodder crops and how to prepare feed mixes.

During the dry season, Duncan Ng'ang'a from Mukinduri started making and feeding silage, noting: "my cow showed signs of heat with no delay, and now she is in calf." According to him, the happiest consequence for his family is that his wife has less work to do: "She does not have to go away to look for fodder anymore." He has already bought maize seeds to plant for the next season, and will use the maize to make more silage. On Beth and Simon Mwathi's family farm in Mukinduri, they now feed lucerne to their cows, and although the cows have recently calved, milk production has not decreased, as usually

happens. As they explained, “Our cows are looking very beautiful. No one can tell it is January [peak of the dry season], and their skin looks as if we were applying milking jelly.”

Organizational innovations

Distribution of functions and responsibilities: meeting in smaller groups

To facilitate their planned activities, group members decided to create thematic teams. The market team took charge of obtaining information on markets, competitors, etc. The patrol team developed and implemented a participatory monitoring and evaluation system. The milk quality team developed standards to guarantee the highest milk quality and learned how to test milk.

This distribution of functions and responsibilities helped with the implementation of activities and with achieving a common goal. In Mukinduri, groups organized themselves into sub-groups of young men, women and elders. In Lare, a sub-group organized by geographical proximity met to plan for and reflect on implemented activities.

Distributing functions and responsibilities among sub-group members provided a level of empowerment not possible in larger groups, since almost all members have a specific responsibility and are enthusiastic about accounting for it. It also promoted inclusion within the community, as the lead management committee, teams and sub-groups included women and men, as well as ethnic minorities. In smaller groups, discussions were more profound because members felt better able to express themselves. These dynamics enhanced the participation of all members and reinforced shared learning. It allowed all voices to be heard, which helps in decision-making. The combination of these factors was very important in balancing power relations among members and leaders.

General meetings as effective communication channels

To improve the attendance at general meetings, Mukinduri group members decided to make general meetings mandatory, and to reward all those who participated with a raffle ticket (after every meeting, the two farmers with winning raffle tickets go home with money in their pockets). Due to the extent of issues to be discussed, members decided to meet twice a month, each time in the house of a different farmer.

A nominated chairperson puts forward an agenda; the treasurer then outlines recent expenditures and reports on the groups’ funds. Members of the various teams and sub-groups report what they have done since the last meeting. The secretary takes notes and reads them out at the end, for approval by all members. This meeting structure allows for adequate time to share and plan as a group, and to solve any problems that may arise. Before and after meetings, there is always time for informal conversation. Since people meet in the home of a different member each time, the meetings are also an opportunity to learn about the various



approaches used on each farm. Under these conditions, the farmers have gotten to know each other better, new friendships have begun, and confidence among them has grown.

The Lare group members meet once a month in a community centre. Since the geographical area where members live and farm is larger than that of the Mukinduri group, the farmers do not necessarily know each other outside of the group context. Meetings are never long enough to cover all the issues, and there are always things postponed until the next meeting. There is not the same level of trust and bonding in Lare as in Mukinduri. The same is true for the implementation of activities. Implementation progress is faster in Mukinduri, and this appears to be affected by the differences in how the meetings are organized.

Being accountable: keeping records and monitoring and evaluation

Keeping records is not common among smallholder farmers in Kenya. In both farmer groups, however, members came to see the need to record some aspects of their dairy activities. Group members started record-keeping by following a role model: an elderly farmer who kept detailed records of his farming for many years. To complement and



reinforce this new practice, the authors met with members of both groups every two weeks for three months to share experiences and help each other. Individual farmers have adapted the structure of their notebooks to focus on the information that they perceive is the most important, but they usually include total production, morning and evening milk volumes, price variation, and money earned at the end of the month. One farmer, Beth Mwathi, even decided to keep track of the milk given to her calf to ensure that when she sells the animal she will not lose money.

As farmers in the two groups started testing innovative practices and recording their farm activities, they welcomed the idea of a monitoring and evaluation system. A patrol team was formed in each group to develop and implement a system that could be used by all group members. As Francis Wanjau of the patrol team in Mukinduri stated, “We are the eyes of the group. We should [see] if the activities planned and implemented are taking us towards our common goal.”

The information collected by the patrol team is analyzed and then shared during general meetings. Individual members use the results to plan for the following season, and the group as a whole is better able to organize further collective activities. The monitoring and evaluation efforts also create a valuable additional opportunity for members to share their experiences and reflect on the effectiveness of various activities.

Lessons learned

Group members have learned several valuable lessons:

- Groups matured by using general meetings as an effective communication channel and by establishing inclusive and collaborative dynamics.

- In Mukinduri, organizing general meetings in members' homes increased communication between individuals and highlighted what they do together as a group.
- The distribution of functions and responsibilities among all group members was key to balancing power relations among members and between members and leaders, and helped maintain the motivation to continue acting toward a common goal.
- In farmer-to-farmer exchange sessions, members shared knowledge, experiences and perspectives, which promoted a willingness to test innovative practices and technologies.
- The monitoring and evaluation system was useful for sharing stories of what individual members were implementing, and for increasing motivation.
- Keeping records, complemented by monitoring and evaluation, enhanced systematic learning. Written documentation — with both words and pictorial material — helped members recount past experiences and reflect on them.
- Linking with other scientists from the authors' research networks and making use of laboratory analysis helped group members deepen their understanding of shared problems.
- Working together to assess technical innovations gave the group time to mature and develop organizational changes. This enabled them to take on more responsibilities, which ultimately supported the goal of selling their milk collectively.



Under this strategy, smallholder farmers worked jointly to improve the benefits from milk production. As part of a collaborative learning approach, farmers are co-developing their own organizational and technical innovations that can support their improved practices. All members are active participants in their process of change.

Meetings are used as effective and inclusive communication channels where achievements are shared and celebrated, activities are planned and problems are solved. Short-term and long-term benefits enhance the motivation to continue working. Peer-to-peer exchange sessions are a powerful empowering tool.

Acknowledgements

The authors thank Andrew Maina for all his collaboration and support during the group processes, especially in relation to his facilitation and translation. This article is a result of joint project work on reducing post-harvest losses and adding value in East African food value chains (www.reload-globe.net). Funding by the German Federal Ministry of Education and Research (BMBF) in the framework of the GlobE initiative and co-funding by the German Federal Ministry for Economic Cooperation and Development (BMZ) are gratefully acknowledged.

Reference

Muriuki, H.G. 2011. *Dairy Development in Kenya*. Rome, Italy: Food and Agriculture Organization.