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Karare Women
Dairy Cooperative



ADAPTive stakeholder meeting



Mövenpick Hotel, Nairobi, Kenya

5th December 2024

Participants:*Stakeholder representatives*

Hussein Kassa, Marsabit County

Abdifatah Omar Abdi, Anolei Women Milk group – Isiolo County

Dr. Fred Odhiambo, Kenya Dairy Board

Wycliffe Rachuonyo, Kenya Bureau of Standards

Dr. Flookie Owino, Directorate of Veterinary Services

Dr. Peter Ndirangu, KALRO

Dr. Beatrice Kiage, APHRC

William Thari, KIRDI

Prof. Jackson Kwanza, JKUAT

Sophia Lekuton, Laisamis Constituency, Marsabit

ADAPTiVE project team

Monicah W. Maichomo, KALRO

John Kinyuru, JKUAT

Jørgen Dejgård Jensen, UCPH

Salome Bukachi, UoN

Samuel Imathiu, JKUAT

Eucabeth Majiwa, JKUAT

Søren Bøye Olsen, UCPH

Mohammed Hussen Alemu, UCPH

Sigrid Denver, UCPH

Tove Christensen, UCPH

Jacob Koome, JKUAT

Antonate Owuor, JKUAT

Jacquelyne Nnassumo, UoN

Sabdio Llogol, KWDC

Musa Djillo Shande, KWDC

Communication/media:

Jim Maina JKUAT,

Dennis Otieno, Royal Media

Programme

Moderator: John Kinyuru

Agenda:

1. Welcome and introduction to the meeting
2. Introduction to the ADAPTiVE project's research and development activities /Jørgen Dejgård Jensen
3. Presentation of plans for dissemination, knowledge sharing and capacity building /Jørgen Dejgård Jensen
4. Discussion and stakeholders' feedback
5. Any other business

1. Welcome and introduction to the meeting

Dr. John Kinyuru from JKUAT opened the meeting and welcomed all participants.



Specific welcome addresses were given by:

- a. Jørgen Dejgård Jensen, coordinator of the ADAPTiVE project
- b. Hussein Kassa, Chief Officer of Trade, Marsabit County
- c. Monicah Maichomo, leader of ADAPTiVE's dissemination work package
- d. Prof. Salome Bukachi, on behalf of UoN's Vice Chancellor
- e. Prof. Jackson Kwanza, JKUAT Deputy Vice Chancellor on behalf of JKUAT's Vice Chancellor

After the welcome addresses, Monicah Maichomo introduced the objectives of the meeting as follows:

1. To introduce the ADAPTiVE project to stakeholders
2. To understand the most prevalent food safety problems along the dairy value chain in the pastoral communities in view of climate change
3. To obtain insights on challenges faced by smallholder dairy pastoral communities
4. To gain insight into current climate change adaptation strategies

The expected outcomes of the meeting were:

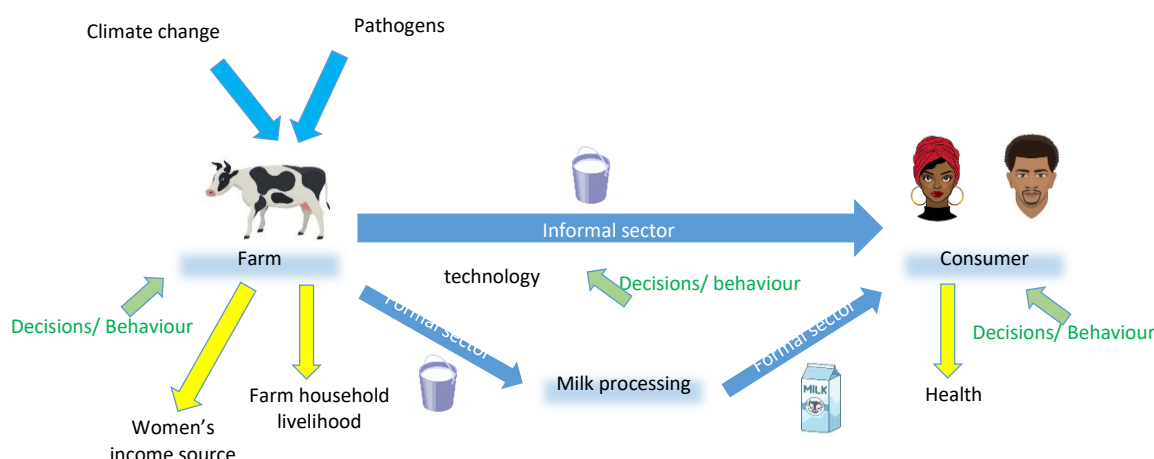
1. That the stakeholders should get a clear understanding of the project's scope, goals and relevance
2. That the project should gain insights from the stakeholders regarding food safety issues specific to pastoral dairy systems, and
3. The project develops a roadmap for an optimal implementation of the project.

Introduction to ADAPTiVE's research and development activities

Professor Jørgen Dejgård Jensen from Copenhagen University gave an overview of ADAPTiVE's project framework (Fig 1), including the problem statement, research questions, research activities and expected research outcomes, as well as thoughts about the dissemination and operationalization of the research outcomes.



Figure 1. Overview of Kenya's cow milk value chain from ADAPTIVE's perspective



The cow milk value chain in Kenya comprises of both a formal and informal sector, with the informal sector constituting a significant portion of the industry. Milk production is an important source of income and supports the livelihoods of many pastoral households, particularly in arid and semi-arid areas (ASAL), where it plays a vital role for women in these households. However, the sector — especially the informal milk sector — faces significant challenges related to food safety, which can lead to health issues for milk consumers. These food safety concerns are influenced by climate change factors such as heat stress, water scarcity, and shifts in humidity. These issues stem from biological, chemical, and physical contaminants and are further impacted by decisions made throughout the milk production, transportation, processing, retail, and consumption stages of the dairy value chain.

Against this backdrop, the overall objective of ADAPTIVE is to promote the adoption and sustained use of food safety strategies that are adapted to climate change, including the following specific objectives:

1. Map the most prevalent food safety problems in the Kenyan pastoral dairy sector, the influence of climate change, impacts on livelihoods and value chain actors awareness
2. Understand constraints and preferences of smallholder pastoral female dairy farmers for adopting food safety practices
3. Develop food safety strategies adapted to climate change and evaluate their impacts on food safety and livelihood outcomes
4. Assess consumers' and other stakeholders' preferences for food safety in dairy products
5. Develop guidelines and market infrastructures to increase farmers' adoption of climate-robust and livelihood-sustaining food safety strategies

In order to meet these objectives, the project includes both research and outreach activities. The research activities combine food sciences and social sciences and will focus on three main topics:

- 1) To investigate the nature and impacts of critical food safety issues in Kenya's informal pastoral dairy sector, including the effects of climate change and human decision-making, using a combination of scientific and social science research approaches.

- 2) To explore the motivations, constraints, and decision-making processes of dairy farmers, consumers, and other stakeholders in regard to dairy product safety, using economic and social science research methods.
- 3) To understand the mechanisms, decision-making processes, and impacts of collective technological solutions to food safety challenges, utilizing both scientific and social science methods.

The outreach activities include the **dissemination of research findings** through various channels, such as articles in newspapers and magazines targeting stakeholders in Kenya's dairy value chains, workshops with these stakeholders, social media platforms, the project website, academic publications, and conference presentations for the scientific community. Additionally, the activities focus on **capacity-building efforts**, including the training of four PhD candidates and collaborative work between junior and senior researchers from institutions in both Denmark and Kenya.

Expected outcomes of the research activities include outcomes at individual dairy farms and for the entire pastoral dairy value chain. At the farm level, anticipated outcomes include identifying problematic farming practices that can be improved—both under current conditions and in the context of climate change—as well as providing evidence on the opportunities and barriers to adopting better practices. For the dairy value chain, the research aims to evaluate the potential and challenges of implementing new technologies and procedures for milk collection, identify new market opportunities for safer milk, and determine the necessary and feasible infrastructural changes required to enhance the milk market.

After this introduction, the floor was opened for questions and comments from the stakeholders.



This discussion was moderated by Dr. Monicah Maichomo, KALRO.



Hussein Kassa - Marsabit County director of Trade & Industry

From the point of view of Marsabit County, the issue of resilience in dairy production is very important, and Marsabit County is looking forward to the project implementation and its potentials in terms of improved market access, value addition and capacity building in the county's dairy sector.

Hussein Kassa

The project will feed into at least three important policy areas in Marsabit County namely Marsabit trade and investment policies, Public-private partnerships policy, and Food quality and safety strategy. As such, the project can help the county's dairy sector to attain enhanced climate resilience, economic empowerment, climate adaptation, innovation, sustainable food supply.

Professor *Jackson Kwanza* was representing the Vice Chancellor of JKUAT. He stressed that livestock research was generally under-represented in Kenya.

Among the main problems to be dealt with, he mentioned the drying out of grass in dry seasons, which leads to lower feed supply and in turn lower milk yields and deteriorated animal health.

Regarding ADAPTIVE's research questions, he expressed concern that the project's proposed solutions for climate-robust food safety improvements might result in higher production costs, potentially reducing the economic sustainability of milk production.



Prof. Jackson Kwanza



Dr. Flookie Owino

Dr. Flookie Owino from the Directorate of Veterinary Services also highlighted the potential for higher costs associated with food safety improvement interventions, which could lead to shifts in production practices. He raised the question of whether increasing milk production could help boost incomes to offset these costs. Additionally, he emphasized the importance of considering current indigenous practices, and the existing markets where milk is sold.

Dr. Owino noted that pastoral milk producers have been overlooked for a long time and that there is a need to professionalize this sector and its market.

In response to the concerns raised by Professor Kwanza and Dr. Owino regarding increased costs, Jørgen Dejgård Jensen explained that a key focus of the economic research in the ADAPTIVE project is improving value addition. For interventions that may increase costs for value chain participants, the project will also evaluate the value created by such measures, such as reduced spoilage or access to higher-value markets where products can command better prices.



Dr Fred Odhiambo

Dr. Fred Odhiambo from the Kenya Dairy Board highlighted that food safety issues fluctuate over time, such as with seasonal variations. He suggested that intervention research should consider using longitudinal data rather than cross-sectional data to better capture these dynamics.

On farmers' practices, Dr. Odhiambo emphasized the importance of understanding farmers' knowledge, particularly regarding antibiotics.

He also inquired whether the project's analysis of microbial load would include an examination of antimicrobial resistance in pathogens such as *E. coli* and *Staphylococcus*.

Fred furthermore asked the project team to consider the notion/implication of "informal" dairy sector. He pointed out that some farmers pasteurize their own milk, meaning that if unpasteurized milk is a key criterion for defining informality, these farmers would still be classified as part of the informal sector despite their efforts to improve milk safety.

Dr. Odhiambo further noted differences in the milking processes for cows and camels, emphasizing that different individuals are typically involved in milking these animals. However, cow and camel milk are often sold in parallel marketing channels. As such, he recommended that the project considers both milk sectors.

In response, Mohammed Alemu from the project team acknowledged the suggestion and indicated that the project could consider the suggestion



Sophia Lekuton

Musa Shande and *Sophia Lekuton* represented Karare Women's Dairy Cooperative (KWDC), that had previously participated in an intervention study with USAID, where the motorbikes were provided in order to secure fast transportation of raw milk to the dairy factory.



Musa Djillo Shande

KWDC has its own dairy factory, from which they sell milk to some larger dairies as well as directly to the consumers. There are approximately 40 members of the cooperative, who are joint owners of the factory, but the factory receives deliveries from approximately 2000 farmers. The factory has production lines for cow and camel milk.



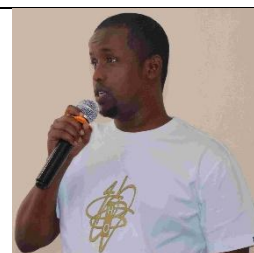
Dr. Beatrice Kiage

Dr. Beatrice Kiage represented the APHRC. She pointed out that communities are also doing something to improve food safety and adapt to climate change, and these activities should be taken into account. Some of the main challenges for these communities include: scarcity of water resources and storage of rain water, and sustainable energy supplies (for example, burning wood deteriorates the biomass resources).

Community groups and their capacities can play important roles in knowledge sharing and dissemination.

Dr. Salome Bukachi replied to this that the project has strong focus on indigenous knowledge and practices

Abdifatah Omar Abdi represented the Anolei Women Milk Cooperative dealing with camel milk. He noted that during rainy seasons, nomad farmers have access to plenty of feed, but with climate change they experience more and longer dry periods. In the rainy season, the milk production is high and price decreases, whereas in dry seasons, milk production is lower (one fifth of the production in rainy seasons) and the milk price goes up. Against this backdrop, he asked if the research in ADAPTive could be expected to provide a solution to this challenge.



Abdifatah Omar Abdi

Jørgen Dejjgård Jensen responded to this comment by suggesting that one solution to the variability in feed supply and milk yield could be to process some of the milk during high-production seasons into products with a longer shelf life, such as Ultra Heat Treated (UHT) milk, milk powder, or fermented products. He acknowledged, however, that this approach would require investment in processing capacity, which would only be utilized during certain periods of the production year.



Wycliffe Rachuonyo

Wycliffe Rachuonyo - Kenyan Bureau of Standards (KEBS). He found the project to be very timely in relation to the United Nations' Sustainable Development Goals.

Regarding market access, he noted that product standards facilitate trade, and that KEBS is currently working on extending product standards to Small- and Medium-sized Enterprises (SME). He also noted that labelling schemes are backed up by standards, such that a labelled product is compliant with a set of underlying product standards.

Mr. Rachuonyo mentioned that Codex Alimentarius is working on an international standard for camel milk, which will facilitate international trade with camel milk but will also facilitate the work with national standards.

He encouraged the project team to consider international trade perspectives in the project's research activities. Finally, he noted that implementation of product standards requires training of value chain participants.

Dr. Peter Ndirangu from KALRO is an experienced livestock researcher. He mentioned that camel milk production is a relevant part of the Kenyan dairy sector, also in relation to drought resilience. He also mentioned that long transport distances necessitate cooling, and this is a challenge that needs to be dealt with.

He also noted that there can be issues regarding milk adulteration. He encouraged the project team to incorporate adulteration as well as zoonotic diseases in the food science-based research activities.

Regarding dissemination of results, Dr. Ndirangu suggested to translate the dissemination material so that it is targeted to local audiences, considering the diversity in languages used in different local areas.



Dr. Peter Ndirangu

William Thari was representing KIRDI. In his remarks, he pointed to the fact that it is important to understand the indigenous knowledge in the local communities, such as the existing local beliefs/traditions about storing milk, its shelf life and health aspects. A possible outcome of the project could be to validate and provide scientific documentation for this indigenous knowledge.



William Thari

Regarding climate resilience, it would be relevant to look into:

- Feed supplies, including the quality and safety of these feed supplies, e.g. in terms of mycotoxins
- Water supply, parasites etc., noting that hygienic practices requires clean water

Regarding the project's dissemination strategy, Mr. Thari suggested to activate local communication channels, including local media (e.g. local radio stations) local politicians, local authorities.



6. Any other business and closure of the meeting

After the discussions, Jørgen Dejgård Jensen summarized the feedback from the stakeholders. In his summary, the feedback was on the following focus points:

- The project should focus on the potential impacts of climate-adapted food safety strategies on value addition within the dairy value chain, such as reduced spoilage and greater compliance with product standards.
- It is important to take current indigenous knowledge and practices into consideration
- It is also crucial to recognize the role of local communities in understanding current practices and in driving changes in these practices and behaviors.
- The stakeholders have provided valuable suggestions for food safety measures that are relevant from their perspectives.
- Even though the research focus in parts of the ADAPTiVE project is on the cow milk value chain, stakeholders have expressed interest in including camel milk in the project's scope as well.

Jørgen Dejgård Jensen concluded his summary by thanking all the stakeholders for their active participation and for providing valuable questions and comments to the project team.

Dr. John Kinyuru concluded the meeting and thanked the stakeholders and the project team for a very good and fruitful stakeholder meeting.

The ADAPTiVE project team's post-meeting reflections on the stakeholder feedback

After the stakeholder meeting, the ADAPTiVE project team had the opportunity to reflect upon and discuss the stakeholders' inputs and feedback.

One key takeaway from the feedback was that costs of alternative interventions will be a critical issue in regard to the feasibility of such interventions, and that it will be important for the project to consider the economic implications for farmers and other stakeholders in the dairy value chain.

There is strong seasonality in production conditions and food safety challenges, and this is important to consider, both in the planning of intervention studies, but also in the broader interpretation of research findings. In arid and semi-arid lands (ASAL), the capacity and methods to store and handle rain water are important for food safety, both via the role of water for the cows and for farmers' personal hygiene, and this also should be taken into consideration in research design and interpretation of findings. And because of the seasonality, milk yields as well as milk prices vary substantially over the year, which should also be thought of in the development of strategies.

The ADAPTIVE project focuses mainly on cows' milk. Camel milk however plays an important role in the Kenyan dairy sector, and the project might benefit from considering the camel milk sector in some of the research and communication activities – for example in project elements dealing with aspects on the sector or value-chain level – given that international standards for camel milk are on the way and that engaging with international markets could be a way to reduce price fluctuations. On the other hand, it may still make sense to focus on cows' milk in the project's intervention study.

There seems to be an infrastructure in Marsabit County, for example in terms of communication channels, farmers' networks etc., which can be utilized to maximize the impact of ADAPTIVE's dissemination efforts.

Media Coverage of the Stakeholder meeting

JKUAT News: Climate Adaptation Project Launched to Boost Dairy Sector in Marsabit County, <https://www.jkuat.ac.ke/climate-adaptation-project-launched-to-boost-dairy-sector-in-marsabit-county/> (accessed March 6, 2025)

University World News – Africa Edition: Agricultural research project targets sustainability goals, <https://www.universityworldnews.com/post.php?story=20250113055933780> (accessed March 6, 2025)

PanAfrican Agriculture: Dairy farmers in Kenya's Marsabit County are set to benefit from a multi-million research initiative aimed at tackling climate change challenges, <https://panagrimedia.com/dairy-farmers-in-kenyas-marsabit-county-are-set-to-benefit-from-a-multi-million-research-initiative-aimed-at-tackling-climate-change-challenges/> (accessed March 6, 2025)

Dairy Business Africa: JKUAT launches climate adaptation project to boost dairy sector, <https://dairybusinessafrica.com/2024/12/09/jkuat-launches-climate-adaptation-project-to-boost-dairy-sector/> (accessed March 6, 2025)