

Data on farmers' perception of push-pull technologies under irrigation and under rain-fed conditions were collected. Results show that farmers are satisfied with brachiaria and desmodium for the following reasons: i) crops perform well, ii) crops can be transplanted, iii) crops reshoot with 24 hours after harvesting, iv) crops tolerate draught (roots survived underground and reshoot after the first rain), v) crops are palatable for livestock and other animals (e.g. gazelle and tortoise that previously use to eat farm crops).

Management of livestock ticks through identification and cataloguing of diseases carrying ticks

The identification and cataloguing of diseases carrying ticks was finalized. The said cataloguing was an important activity for Somaliland since the last assessment among pastoralists to identify tick species and associated transmitted diseases was carried out in 1974.

- 355 ticks were collected (Wajaale and Hargeisa market).
- 16 staff from three institutions (Ministry of Livestock, University of Hargeisa and Gollis University) were trained in tick identification and control.
- Species distributions and associated diseases were mapped.
- Preparation of brochure on different tick species found in Somaliland is underway.

Large-scale field trials to test and disseminate novel formulation of bioacaricide Metarhizium anisopliae 7 and related dissemination will be carried out by the end of year 2015. This novel formulation proved to have an effect on tick engorgement and number of eggs.

Study on vector-borne camel diseases and identification of control measures

The study on vector-borne camel diseases was finalised. Blood test was completed. Main pest and diseases were identified. Camel health is severely constrained by:

- Surra 100% - Surra causes morbidity of up to 30% and mortality of about 10% - 15%
- Mastitis 100%;
- Helminthes 100%;
- Camel mange 100%;
- Pneumonia 100%;
- Anaplasmosis 25%.

Brucellosis was also identified as a major constraint. Activities for scaling-up *icipe* technologies for control of biting flies and surra are underway. The objective is to reduce disease levels and fly numbers by at least 30%.

In each selected targeted area: i) Disease and fly levels are monitored monthly in collaboration with the Ministry of Livestock; ii) Pastoralists and extension staff were trained in deployment and maintenance of *icipe*'s Insecticide treated targets for control of biting flies; iii) Additional treatments against mastitis are carried out by the team on the ground. The team has in fact the mastitis test kits - they test the animals and treat them with Penikan P or Terrexine. Plans are underway to treat other diseases such as helminths, camel mange, pneumonia and tick bone diseases.



Installation of screens to reduce incidence of biting flies in order to reduce surra has been organized in four priority villages (Karinsocdaal, Megaagta Wayn, Fardawsa, Ergimo) for a total of 2,000 pastoralists.

Study of the seasonal patterns of camel migrations to optimize camel husbandry practices and their impact on natural resources and proposal of management strategies

Main activities aimed at i) enhancing self-sufficiency of the newly established GIS unit at Ministry of Livestock through in-situ and long distance on job trainings and ii) mapping invasive species that have a direct impact on milk production.

Two crops were identified and mapped; *Prosopis juliflora* (invasive shrubs) and *Parthenium hysterophorum* (invasive weed). Both crops have a negative impact on milk production: i) the *Prosopis* population, increased especially around the river, making harder for the animals to have access to drinking water; ii) the *Parthenium* when eaten by animals, generate bitter taste in the milk - reduce its commercial value. Areas infested by *Prosopis juliflora* was accurately mapped using 250-meter NDVI data trends (between 2001 and 2014). A GIS map for Somaliland was produced. Areas infested by *Parthenium* were not yet mapped. A local botanical expert is about to be recruited to get additional information from the ground.

Mapping areas where pasture degradation occurs due to invasive species infestation would ultimately help pastoralists to avoid these areas and land managers to instigate possible invasive species mitigation measures at these specific sites. Once the *Prosopis* growing areas identified said crop could be used for charcoal production; this will reduce the prevailing practices of cutting "good" trees for charcoal.

Strengthening organisational infrastructure of six hygiene units (FAO)

Through a consultative process FAO in collaboration with cooperative members, community leaders and the Mayors of the respective villages and towns identified six sites and agreed upon the location of the solar powered cooling containers in each of these satellite centres for milk aggregation. The selected sites are located in the following villages: Gabiley, Darasalam, Sabawanag, Farawayne, Qoolcaday, Hargeisa (Gobanimo Milk Market). Land for the installation of the cooling containers in each of these sites has been allocated and documentations for public use obtained from relevant authorities.

Solar powered containers for the six satellite milk collection centres were procured and delivered to the port of Berbera awaiting transfer to the various designated sites. Platforms and bases for the solar powered coolers are under construction in these sites. SolFAO has distributed over 800 sets (out of the 5,000 procured) of 10 litre capacity Mazzi cans to 400 registered cooperative members. The Mazzi cans are equipped with funnels for mastitis detection and used both for milking and transportation of milk to satellite milk collection centres. The use of Mazzi cans will facilitate the transportation process at producers' level. The Mazzi cans are intended to substitute plastic jerry cans but not to replace other hygienic containers, such as aluminium cans, that were purchased by the project.



icipe – Working in Africa for Africa...

icipe – African Insect Science for Food and Health – was established in 1970 in direct response to the need for alternative and environmentally-friendly pest and vector management strategies. Headquartered in Nairobi, Kenya, *icipe* is mandated to conduct research and develop methods that are effective, selective, non-polluting, non-resistance inducing, and which are affordable to resource-limited rural and urban communities. *icipe*'s mandate further extends to the conservation and utilisation of the rich insect biodiversity found in Africa.

Through its research in livestock disease vectors, *icipe* has been able to build capacity from strategic basic research and adaptive research, to technology development and transfer, through strategic partnerships with government departments, research institutions and community-based organisations.

The Centre has also been able to develop expertise in quantitative vector ecology, behavioural and chemical ecology, and biocontrol, and integrated this basic knowledge in developing technologies that farmers can use.

In the process, *icipe* has gained considerable experience in mobilising communities, empowering and organising them for undertaking tsetse and trypanosomiasis control in different agro-ecosystems and animal husbandry practices.

icipe's technologies have improved the livelihoods of communities from eastern to southern Africa wherever savanna tsetse are found.

Donor: European Union

Partners: The International Centre of Insect Physiology and Ecology (*icipe*) and the Food and Agricultural Organization of the United Nations (FAO) in collaboration with the Somaliland Ministry of Livestock.

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Sustainable Peri-Urban Milk Value Chain Development in Somaliland

2013–2016



EUROPEAN UNION



MINISTRY OF LIVESTOCK,
SOMALILAND



icipe
African Insect Science for Food and Health



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Sustainable Peri-Urban Milk Value Chain Development in Somaliland

Overall objective: To enhance performance of dairy value chain in Somaliland.

Result area 1: Dairy sector governance and coordination strengthened. Its aims are twofold: (1) supporting the Somaliland authorities in enacting of laws and by-laws regulating the milk sector after consultation with stakeholders; and (2) supporting the government in establishing the institutions to enforce milk laws and by-laws.

Result area 2: Milk production, quality and market linkages along the dairy value chain increased. Milk productivity depends basically on animal nutrition and health. The current approaches to fodder production and animal health control proved to be insufficient and un-economical. The project aims at promoting the increase of production and productivity by using existing feeding and diseases control technology while testing and eventually disseminating innovative technologies.

Result area 3: Milk and dairy products production and marketing improved through promotion of gender-based income generation opportunities in all phases of the value chain. This result area aims at:

- Supporting to the different actors of the value chain to improve their business and the milk quality by promotion of associations and cooperatives, awareness creation, training and matching grants.
- Rehabilitating the Gobanimo milk market to improve milk handling at retailer level.
- Establishing a pasteurization plant in Hargeisa.
- Training and provision of Business Development Services on production and marketing of soft milk products (cheese, ice-cream, butter, ghee, etc.).
- Provision to qualified cooperatives and associations of matching-grants.

Direct beneficiaries: Livestock keepers, dairy and fodder producers, Somali domestic milk processors and associated industry operators, milk traders and women groups' sellers and public institutions including Ministries of Livestock and Quality Control Commission.

Indirect beneficiaries: Pastoral communities in Somaliland and the wider public/consumers communities: 50,000 Households, i.e. 300,000 individuals in Hargeisa.

Target Region: Somaliland, Moroodi Jeex Region

Start and end date: 18 June 2013 – 17 June 2016



Solar-Powered container. –Photos: FAO



Transportation of milk in Mazzi cans. –Photo: FAO



Training for milk traders in Hargeisa. –Photo: FAO

Activities carried out so far:

Dairy sector governance and coordination strengthened through setting up institutional and governance structures, such as legal and regulatory frameworks. The FAO and the Ministry of Livestock reviewed and revised the Somaliland Dairy Policy Act, and Standard Operating Procedures including sanitary procedures to make it more responsive to the needs of the dairy sector. Dairy producers and retailers in ten villages were organized into ten dairy cooperatives, registered and trained in various aspects of dairy cooperative development, including: group dynamics, market-oriented dairy production, and governance.

In close collaboration with Rural Organization for Advocacy and Development (ROAD), an international service provider, FAO is working with the ten established dairy cooperatives i) to ensure vertical and horizontal linkages across the dairy value chain actors, ii) to develop entrepreneurial skills through training iii) to create market linkages with various business development service providers such as transporters, veterinary service providers, dairy production and consumption centres, iv) promote dairy value addition and v) to facilitate financial access by linking selected cooperatives to identified financial institutions.

Milk production, quality and market linkages along the dairy value chain increased through dissemination of research results to beneficiaries. The push-pull technologies are now reaching over 100 farmers. The *Brachiaria* introduced by the project as animal feed proved to be particular suitable drought tolerant crop for Somaliland.

Similarly up-scaling plans are underway to test and disseminate novel formulation of bioacaricide *Metarhizium anisopliae* for tick control. Activities for scaling-up *icipe*'s technologies for control of biting flies and surra in camels for 2,000 pastoralists are also underway. The objective is to reduce disease levels and fly numbers by at least 30%.

Two invasive crops *Prosopis juliflora* (invasive shrub) and *Parthenium hysterophorou* (invasive weed) were identified and mapped. Both crops have a negative impact on milk production; the *Prosopis* are impeding the animals to have access to drinking water while the *Parthenium* when eaten by animals, generate bitter taste in the milk - reduce its commercial value. Mapping areas where pasture degradation occurs due to invasive species infestation will help pastoralists to avoid these areas and land managers to instigate possible invasive species mitigation measures at these specific sites.

FAO promoted market linkages and established trade cooperatives to ensure vertical and horizontal linkages across the dairy value chain actors. Ten villages were organized into ten dairy cooperatives comprising for a total of 619 beneficiaries.

In the area of Behavioral Change Campaigns to address risky milk-handling practices, FAO has worked with radio and TV stations to air key messages. Bill boards have been completed and displayed at various locations across Hargeisa city.

Milk and dairy products production and marketing improved through promotion of gender-based income generation opportunities in all phases of the value chain. As part of strengthening organizational infrastructure of six hygiene units FAO, through a consultative process in collaboration with cooperative members, community leaders and the Mayors of the respective villages and towns, identified six sites and agreed upon for the location of the solar powered cooling containers in each of these satellite centres for milk aggregation. Land for the installation of the cooling containers in each of these sites has been allocated and documentations for public use obtained from relevant authorities.

FAO also distributed over 800 sets (out of the 5,000 procured) 10-litre capacity Mazzi cans to 327 registered cooperative members. The Mazzi cans are equipped with funnels for mastitis detection and used both for milking and transportation of milk to satellite milk collection centers. The Mazzi cans therefore are intended to substitute for plastic jerry cans but not replace other hygienic containers such as aluminium cans.

The rehabilitation work at Gobanimo milk market and toilet facilities to improve milk handling at retailer level in Hargeisa is underway. Discussions have been carried out with the municipality on private-public partnership arrangements for managing both the market and toilet facilities after completion.



Fodder feeding to cows. –Photo: FAO



Tick collection in Wajaale. –Photo: FAO

Details on selected activity components:

Assessment of the nutritive value of available indigenous feed resources for milk production

The nutritive value analysis of available indigenous feed resources includes; i) Grasses – natural growing – Dixi, Balchoole etc, ii) Browse forages – sogsog, gob etc, iii) Crop residues – sorghum, maize, beans etc; iv) Introduced forages – Bracharia, Desmodium; v) Concentrates – corn (borash). After completion of the analysis information will be used to formulate different diets for each region depending on the feed resources available there.

Obtaining equipment to support establishment of an Animal Nutrition Laboratory in the University of Hargeisa is an on-going activity which will enhance national capacity of animal feed analysis once completed. Training on animal nutrition and feeding and feed analysis has been conducted for Somaliland staff from the Ministry of Livestock and University of Hargeisa.

Push-pull programme in the agro-pastoral areas of North-West of Hargeisa

The Push-pull technique developed by *icipe* is based upon the cultivation of cereals in association with brachiaria and desmodium to help farmers produce fodder (brachiaria, desmodium and cereal stocks) and has positive impacts on soil fertility (desmodium mainly), and to reduce stem borer pests in cereals in an environmentally-friendly way without use of chemicals.

Research results indicate that push-pull technique is a successful tool to increase milk increment (at least 1 additional litre of milk per day per cow) throughout the year including during the dry season. Brachiaria proved to be particular suitable drought tolerant crop for Somaliland. The introduction of brachiaria could therefore transform the livestock sector. Over 100 farmers already apply the push-pull technique in the target area North-West of Hargeisa. Some farmers already sell fodder and help others with transplanting material of brachiaria.

