



**AICCRA: Optimizing the performance of
cattle fattening to rescue drought-hit
farmers in Senegal**

2022



AICCRA
Accelerating Impacts of CGIAR
Climate Research for Africa



Introduction



Photo credit: IFPRI/Milo Mitchell.

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) helps deliver a climate-smart African future driven by science and innovation in agriculture. The initiative works to make climate information services and climate-smart agriculture more accessible to millions of smallholder farmers across Africa. With better access to technology and advisory services, farmers can better anticipate climate-related events to take preventative action that helps their communities safeguard livelihoods and the environment.

AICCRA has teams in six countries: Senegal, Ghana, Mali, Ethiopia, Kenya and Zambia, who work in four key areas – knowledge, partnerships, innovation and gender and social inclusion.

AICCRA-Senegal aims to enhance the capacity of national public institutions (e.g. Centre Régional d'Excellence sur les céréales sèches et cultures associées de l'Institut Sénégalais de Recherches Agricoles (ISRA/CERAAS), Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM), and the National Agency for Agricultural and Rural Council (ANCAR) etc.) and private enterprises (e.g., input providers, information,

communication and technology companies, media) to develop delivery models for climate services and for climate-smart agriculture knowledge, approaches and tools and to reach and influence over 275,000 farmers and value chain players with climate-informed agro-advisories and new climate-smart agricultural packages and technologies. AICCRA-Senegal targets also to generate training products and set up agritech innovation platforms for sustained promotion of climate services and climate-smart agriculture.

Challenges and opportunities

Across the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA)-Senegal project sites, baseline surveys revealed that out of the 503 households surveyed, 173 farm households owned cattle, i.e. 34.3%. Of these, 118 farm households had calves born in 2021 (during both the dry and rainy seasons). For the majority of those involved in animal husbandry, this is a secondary activity. Women are mainly involved in the activities, ranging from milking to processing. For example, in 61% of the farms, women are in charge of milk processing. The use of female employees is as rare in livestock breeding as in agriculture.

During the dry season, the most productive cows produce an average of 1.9 liters of milk per day, while the least productive produce about 0.75 liters in the implementation sites. During the rainy season, the quantity of milk produced doubles, reaching about 3.5 liters for the most productive cows and 1.6 liters for the least productive. It is important to note that it only rains for three months a year in Senegal and this average milk production yield is one of the lowest in the world. The knowledge of best practices in farming is generally low, and cattle fattening is practised by only 36% of the households that keep animals.

In Senegal, livestock feed is dependent on the production of natural pasture and crop residues. In the rainy season, the livestock production efficiency (milk, weight gain) is good due to the excellent quality of forage (availability of abundant and good-quality vegetation). On the other hand, during the dry season, livestock suffer from undernourishment and malnutrition due to lack of fresh forage. During this season, some farmers set fire to sections of their land to revitalize pasture or their farmland. Thus, there is a drastic drop in milk production during the dry season, and animals exhibit significant weight loss, and the females enter a period of anestrus.



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Why a livestock demonstration field school?

A demonstration field school promotes capacity building efforts – technical, organizational and financial –to enable beneficiaries develop and ensure that their activities are profitable. It contributes to improvement of livelihoods throughout the value chain (production, collection-processing, marketing).

In response to these challenges, the meat and milk value chain component of the AICCRA-Senegal project established a farmer field school on livestock production. The farmers receive training on development of residue-based feed rations to increase the zootechnical performance of animals during the dry season. In addition, a livestock demonstration field school was set up to boost the milk and meat value chains. Specifically, the aim was to: (i) demonstrate how improvement in animal habitat, feed and health can significantly improve milk production and/or weight gain, and even their reproduction; and (ii) showcase the possibility of significantly improving the quality of manure produced by animals (composting) to make it a quality input for a better response of soils and crops, and therefore ensure better yields.

The project promotes ration formulas based on locally available feed to maximize productivity while avoiding wastage. It also supports farmers improve their breeding practices by offering them integrated technological packages (strategic feeding, good management, health) that allow them to produce quality animals that can be sold at premium prices. This is to increase their competitiveness in the market.

Photo credit: AICCRA Senegal.



Innovations promoted

Forage cowpea improvement: Demonstration plots of improved varieties of forage cowpea were set up to provide animals with the right nutrients during the dry season. The forage cowpea has the potential to improve both the quantity and quality of fodder; it also plays a significant role in enhancing soil carbon sequestration, leading to better system efficiency. Leguminous fodder has high nutritive value and can help to improve the diet of ruminants while also sequestering carbon. Therefore, an increase in forage availability during the dry season increases milk production and allows heifers to gain live body weight.

Photo credit: AICCRA Senegal.



Improvement of animal habitat: This comprises a simple shelter that is well-ventilated. It is supported by iron posts or concrete beams and a cement slab, with a width of 5.5 m and a length of 12 m. The space is divided into four compartments (a milking platform, suckler cow compartment, cattle fattening compartment and sheep fattening compartment). The roof is made of galvanized sheets with a bamboo palisade ceiling — improvement of the storage room for fodder, hay, straw and residues/agri-food by-products. The animal habitat is a well-ventilated shelter, with a cement slab and supported by iron poles or concrete beams. It has a width of 3 m and length of 10 m and is divided into three compartments (fodder, hay and/or silage and agro-food residues/by-products), with a minimum height of 3 m and 2.80 m wide.

Improving the quality of animal manure to enhance soil quality (composting): One of the leading causes of low soil productivity in Senegal, and the groundnut basin in particular, is the low level of soil organic matter. Moreover, as currently practised, the addition of animal manure to crop fields (broadcasting or by penning animals) shows that much quantity is needed (up to 5 t of dry matter per ha). However, more than 80% of the nitrogen is lost, and it can cause zoonoses or contain heavy metals. Composting, if done properly, not only reduces risks, but also improves efficiency. Indeed, compost is an organic fertilizer that can be made on the farm at an affordable cost. It comprises decomposed organic material, such as plant residues and/or animal manure, to which nutrients

can be added to enrich soil and plants. The most important input is labour. This involves the digging of a pit in three 2.5 m-wide compartments.

On the other hand, artificial mineral fertilizers are costly, pollute the environment and can harm beneficial microbes that are essential for soil fertility. The response of millet and groundnuts to the supply of improved compost will be evaluated in the field during the 2023 rainy season. These results will be compared to those of farmers who practise broadcasting and utilize mineral fertilizers.

Health monitoring: A health prophylaxis package (deworming + vitamins, vaccination monitoring) will be systematically used to minimize the number of underperforming animals.

Production of knowledge materials (a technical note) on feed availability and seasonality will guide those running awareness-raising sessions on the quality of local feed composition for animals to improve the use of feeds in farms.



Photo credit: ILRI/Karen Marshall.

Breeding and fattening of small ruminants is a popular activity among vulnerable populations, such as women and the youth, in Senegal. However, on their own, these two groups struggle to maximize the benefits of rearing or fattening small ruminants. Creating awareness on the promoted dual-purpose variety and thereafter supplying improved dual-purpose legumes (groundnut and cowpea) seeds to farmers and women groups, and training them on their operations and maintenance would be an effective means of disseminating innovations and ensuring their adoption. Specifically, in the farmer field school on livestock, we demonstrate good hygienic milking practices. These are based on field mechanical pasteurization to avoid raw milk contamination. It ensures improved milk quality and reduces the risk of contamination during transportation, thereby limiting the risk of discharges at the level of the milk collectors.

Recent partnership with the Dairy Dagana Innovation Platform group of stakeholders (comprising +1,500 milk producers made up of traditional breeders, + 65 mini-farms, + 1 farm, +14 collectors of milk, small- and medium-scale processors and distributors, plus other stakeholders including research institutes, rural communities, and government offices working on agricultural development) will be promoted to ensure exchange of technical and organizational skills on feed production and animal health.

Youth entrepreneurship will be further strengthened with training opportunities to equip women and young people with innovative packages to improve their income and easily access the market. These include training them on best practices in compost production, plus

technical and commercial skills by offering practical training and facilitating the sharing of experiences on improving breeding/fattening practices and adapted feeding techniques.

Acknowledgements

AICCRA is supported by a grant from the International Development Association (IDA) of the World Bank.

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