Using digital tools
to manage a milk shed of agropastoralists in West Africa

The Laiterie du Berger dairy in Senegal sources its milk from 1,200 farmers and has developed digital solutions for greater efficiency in collecting milk and paying farmers. What challenges come with the wider use of these tools? What synergies do they help generate? How do they contribute to local development and help coordinate the different actors in the value chain?

LDB's idea is to offer livestock farmers around the town of Richard Toll secured and guaranteed year-round access to the milk market in exchange for a year-round supply of milk. Milk is naturally abundant in this region during the wet season, but becomes scarce during the dry season because of transhumance and fewer pastoral resources. Livestock farmers therefore adopt different feeding and reproduction strategies to maintain, and in some cases increase, production during the dry season. This approach has paid off, as collection during the dry season now exceeds collection during overwintering. But the challenge is now to maintain those levels of collection in unfavourable climatic conditions. Since its founding, LDB has also supplied livestock feed (rice bran, groundnut cake, industrial feed concentrate) for its farmers at preferential prices with limited seasonal fluctuation. The dairy sells roughly 1,000 tonnes of feed a year at its shops within its milk shed.

Digital tools for managing the production zone

After the purchase price of local milk was revised in 2018, local livestock farmers took a strong interest in LDB. LDB expects to increase from 500 tonnes of milk a year to over 3,000 in less than five years. Likewise, it wants to triple the number of its suppliers. To achieve such a quantum leap, it will need to globally revise its practices in the field and its administrative-management procedures in order to be both thorough and swift when dealing with the product and farmers. Through its subsidiary Kossam Société de Développement de l'Élevage (KSDE), LDB has developed an enterprise-resource-planning system dedicated to supplier-customer relations and configured based on the organisation of the company and its interactions with its production zone.

KSDE has developed two mobile applications for milk collection and the sale of livestock feed. The company has also set up a digital SMS payment solution for farmers. Data is entered on forms, and data tables are then generated with lists of references, such as the identification of the farmers (see table opposite).

These three digital solutions will likely be complemented in the coming year by an advisory application for monitoring farms. KSDE supports farmers through an advisory scheme with about fifteen people divided across different sectors within the milk shed. The advisors monitor, as a priority, farms that have invested in stabling for their core milking cows (four cows in production). There are currently 65 of these "mini-farms", and that number will likely reach one hundred by 2022. The advisors will have to monitor a growing number of farms. Monitoring is currently performed with notebooks, and the data is then transferred to an Excel table. In the future, the same form-based system will be used to synchronise data directly, but designing digital tools for monitoring livestock farming is still more complex than managing supplier-customer relations.

Challenges and synergies of digital solutions in local dairy value chains

The increase in digital tools has been a particularly interesting subject of study, especially with regard to its phases of development and dissemination in the field. The changes these tools bring about show how actors in the different value chains are able to adapt and keep up with technological developments, even in isolated rural areas. As part of the transition to digital management of the milk shed, there needs to be an experimentation and learning phase before the use of digital tools becomes routine and fully integrated in normal operations between companies and suppliers.

All involved actors must therefore receive prior training in the use of digital tools, accounting, equipment management and cus-

Delivery of milk at an LDB collection point. The mobile application for collectors and unloaders has simplified data management, product monitoring and payment.

Jean-Daniel Cesaro 2019

tomer relations. Illiteracy in rural areas is an obstacle to the development of these technologies. But with the younger generation, and thanks to LDB's support for the training of young women in particular, there are relays in the field who can take charge of part of the customer relationship between the dairy and the farmers.

The consolidation phase is particularly delicate, as the KSDE operator must utilise the information system and its tools, and maintain its solutions while adapting them to improve relations with suppliers. For most livestock farmers, all of these changes seem imperceptible. But they are vital to the organisation of the general system and to making the dairy more efficient. Maintaining training programmes is essential, but comes with additional costs. The development of digital tools gives the dairy greater control over the production zone, allowing it to quickly target issues regarding the quality of the milk. Monitoring indicators allow department heads and advisors to control production. Predictive analysis based on data collected by the dairy offers new services for farmers while securing the dairy in terms of its repayments. The main interest in digitalising relations between companies and suppliers is certainly the emergence of artificial intelligence (AI) as a new tool in commercial relations and in negotiations between the dairy and farmers. AI facilitates the circulation and transparency of information, speeds up the flow of money, strongly limits fraud and provides a new framework for exchanges between actors in the value chain. Time will tell if this digital solution for the dairy value chain is viable, particularly during pastoral crises. ■

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FOR MORE INFORMATION:
Read the full interview (in French)
https://bit.ly/3D8UtOz

DATABASE
· Unique QR code to identify livestock farmers · Support tool for all transactions with the dairy and all applications

Mobile application for data collection:
For collectors and unloaders working for KDSE

BEFORE	AFTER
• Handwritten note indicating volume of milk collected for each farmer number and deferred entry	• Collector version: quantities of milk recorded directly on the form (farmer number + tank number)
• Emptying of tanks at the dairy, and handwritten note of quantities of milk refused (quality problem)	• After weighing the milk and testing its quality, the dairy validates receipt of the milk in the application (unloader version)
• Comparison of both lists to determine the quantity delivered per farmer	• The farmers supplying the milk are credited, in the KDSE information system, an amount in proportion to how much milk they supplied
• Long and tedious process, requiring a lot of human resources and giving rise to errors	• Simplified data management, product monitoring and payment

Mobile application for food storehouses
For storehouse managers

BEFORE	AFTER
• Centralisation of the sale of feed to the dairy	• Investment in 13 warehouses for storing the dairy's products
• Time-consuming distribution of feed	• Recruitment and training of farmers to manage inventory
• Farmers have to prove the existence and amount of their milk or feed credit, or pay	• Centralisation of data (feed credit and milk credit) using a QR code
	• Quicker payment

Digital payment solution

BEFORE	AFTER
• A record for each farmer (between income from milk and expenses for feed)	• Automated payment thanks to the enterprise-resource-planning system
• Farmers must collect the amounts owed in-person at the start of each month	• Flexible system: funds transferred to bank account, via SMS or via NFC card (contactless) through the Wizzal service
• Difficulties for the dairy in the event of non-payment	• Greater security, more flexibility
	• Average monthly payment: 20,000 FCFA, as most of the milk income is invested in livestock feed for other herds

"90% of the milk
consumed in Senegal is imported in powder form, while 30% of the population are livestock farmers by tradition and are capable of producing milk."

Bagoré Bathily addressed the situation by founding the social enterprise La Laiterie du Berger (LDB) in 2006, as a way to make use of local milk production (see pp. 14-15). LDB collects milk from Fula livestock farmers in the Richard Toll area of northern Senegal, and uses it to develop dairy products. LDB has become the second-largest player in Senegal's yoghurt market, and the biggest processor of local milk in the country. The number of farmers providing milk rose from 450 in 2018 to 1,200 in 2021. Of those 1,200 farmers, 47% are women.

1 Professional software to help companies manage all of their processes (human resources, finances, distribution, supplies, etc.)