A Cyber Shepherd at Work in the Sahel

Pastoralists in Senegal are tracking their wandering cattle herds using cell phones and Global Positioning Systems. (IDRC Photo: Djibril Sy)

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A few steps from the main square of Kouthiaba, a small town some 600 km from Dakar, dozens of pastoralists have turned out on a Sunday morning for the *louma*, the big weekly market that is a tradition in rural Senegal. All are trying to attract the attention of passers-by to the livestock they have to offer.

But amidst the bleating of sheep and goats, the bawling of cattle, and the whinnying of horses, they are also busy, as usual, swapping information and talking about the essential concerns of Sahelian pastoralists: where to find good pasture, the risk of diseases, marketing strategies, and above all, how to manage the seasonal movement or transhumance of their flocks and herds.

This annual centuries-old practice sees herders and shepherds move their animals seasonally when the rains cease, in search of new pasture and watering points. In Senegal, this search takes them from the parched savannas of the north to more fertile areas in the south, a move that is not without its consequences.

An unavoidable practice

In Senegal, the vegetation cover is shrinking, the soils are becoming impoverished, and the desert is advancing. The ever more fragile environment is subject to great pressures, as people and experts alike are sadly aware. In this context, the seasonal movement of livestock is essential to the survival of the herds, but it is also a source of problems.

The movement of herds leads to many conflicts between migrant herders and farmers in the pasture areas, and between sedentary and migrant pastoralists. There is also the risk of introducing or spreading animal diseases in the host area. Moreover, traveling such long distances wears out the already poorly nourished herds, leading to lower milk and meat production.

Yet these migrations remain essential to the economy of Sahelian countries where livestock production accounts for 15 to 35% of gross domestic product and between 15 and 30% of export revenues. Transhumance is thus a central feature of the primary sector in Senegal and provides rural people with 55 to 75% of their income.

Dealing with risks

How can one help rural communities to adopt more efficient livestock management practices and to protect pastures that are threatened, in the long term, by overexploitation?

This question was addressed by a number of African experts at a regional workshop held in Addis Ababa, Ethiopia, and at a West African meeting organized in Dakar in 1998. Their work sparked a research project that was launched in early 2001 to put new information and communication technologies (ICTs) to work for local pastoralists.

The initiative came from the veterinary science and medicine school of Dakar (École inter-États des sciences et médecine veterinaries — EISMV). The project is being carried out in collaboration with the ecological monitoring centre (Centre de suivi écologique — CSE), and with financial support from the Acacia program intiative of the International Development Research Centre (IDRC). Its objective is to encourage pastoralists "to improve the feeding of their animals, to develop livestock production, and to manage the environment sustainably," by using these technologies to obtain and exchange information, explains Yalacé Kaboret, a professor at EISMV and project leader.

Technology to the rescue

The goal is to use new technologies to provide pastoralists with information about resources in the transhumance zones, and to track and monitor the course followed by selected shepherds and their flocks from one point to another in the forestry-pasture zone.

Field surveys were conducted among more than 200 families in three countries (Burkina Faso, Mali, and Senegal), to compile an inventory of traditional practices and local know-how in the use of pastoral resources, with a view to combining them with modern tools and knowledge and making them more accessible.

Three zones, known as "pastoral units" (PU) were selected in Senegal (Kouthiaba, Thiel, and Tessékéré) as sites for a pilot project to demonstrate "the use of ICTs for local communities in tracking the movements of transhumant herds for sustainable management of pastoral resources in the Sahel." In each of these trial zones, herders have been taught to read and to prepare geographic maps by working with GPS (Global Positioning System) devices that are linked to satellites and that can be used for accurate positioning on the ground.

Several of these herders have also been equipped with cell phones to speed up the exchange of information and provide them with an "early warning system" against pending disasters. As well, some herders have received IT training so that they can access information available on the Web. All the equipment needed for Internet connection has been installed in each pastoral unit, where real-time information can be accessed through a site that was built for them in July 2003.

Nicknamed "cyber shepherd," the site (whose name in the local Peule language is "Gallé Aynabé" or "herders' house") offers maps showing which sites are occupied and which have green vegetation, together with an estimated "carrying capacity," indicating the number of animals that can be pastured there without risk to the environment and its resources. "Gallé Aynabé" also devotes pages to ways of recognizing and dealing with animal diseases.

An innovative pilot project

"This is the first time in Africa that this combination of ICTs has been used for tracking livestock migrations," says Kaboret. "This has lifted a number of constraints on us, by making information available about pasturelands and watering spots, for example," says Kéba Sané, president of the Kouthiaba PU. "Before the project, it was very hard for herders to get information, because they had to wait for the *louma* or go off to see for themselves where they should take their animals" during the seasonal migration, says Issa Ndiaye, a livestock expert at the Thiel PU.

"Everything is OK in theory. We started out from a world where we did not know what a computer was, or a land occupancy map, or GPS, and we are now in a world that has appropriated ICTs," says Kaboret.

Yet in practice, people involved in the project are having some trouble putting the new technologies to use in these rural areas. As they point out, most of the beneficiaries cannot read or write, or are literate only in the Peule language. Sometimes connections fail because the network is down, or the power supply is out (most devices run on solar energy), and the equipment is not always well maintained or protected.

These concerns will be addressed as the project, still in the experimental phase, progresses. "We are now thinking about using simpler tools and means for the second phase," says Kaboret.

The main objective of this pilot project is to demonstrate — mainly to decision-makers — that these modern tools can really help to improve pastoralists' living and working conditions. As the project leader puts it, "the basic goal here is to help fight poverty."

Abdoulaye Bouna Niang, Director of Animal Husbandry for Senegal, agrees that resolving the problems of transhumance will contribute to sustainable development and to reduce poverty. The ICT route is a promising way of meeting the concerns of one-third of the country's 9.2 million inhabitants.

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