# Chapter 9
# Telecentre-Based Community Wireless Networks:
## Empowering Rural Community in Uganda

**Dorothy Okello**
*Makerere University, Uganda*

**Julius Butime**
*Makerere University, Uganda*

## ABSTRACT

*This chapter shares the experiences of the Community Wireless Resource Centre (CWRC) as it embarked on the journey to address affordable connectivity for four telecentres in rural and underserved Uganda via telecentre-based community wireless networks. Telecentres have long played a key role in availing access to Information and Communication Technologies (ICTs) and in supporting the provision of universal access. With falling prices and new technologies increasing individual access to ICTs, the telecentre-based community wireless networks need to continually innovate in order to remain relevant to both the telecentres and the partners that together comprise the community wireless networks.*

## 1. INTRODUCTION

The concept of community wireless networks describes a wireless communication infrastructure that is shared and managed by a community. It is based on the possibility for groups or communities to build self owned and operated networks (Wireless Networking in the Developing World, 2006). This chapter focuses on community wireless networks set up at four telecentres in Uganda, namely, Kachwekano and Kabale telecentres in Kabale district, Nabweru telecentre in Wakiso District, and the Lira CPAR telecentre in Lira District. Establishment of the networks involved engagement of the telecentres and of the Community Wireless Resource Centre (CWRC).

DOI: 10.4018/978-1-4666-2997-4.ch009

The CWRC is a research and training centre established in 2006 within the Department of Electrical and Computer Engineering, College of Engineering, Design, Art, and Technology (CEDAT), Makerere University with support from the International Development Research Centre (IDRC). The CWRC arose out of the need to reduce the high cost of connectivity in IDRC-supported telecentres in Uganda, and to explore optimal connectivity models such as sharing the existing bandwidth with neighboring institutions via outdoor wireless networks. It was anticipated that by managing collectively the costs of connectivity at each telecentre, more institutions could get access to Internet without heavy initial investments in satellite hardware and subscriptions. At the time, the predominant option for Internet access in rural communities was via expensive satellite-based connections. The aim of the CWRC was to make connectivity more affordable for telecentres by implementing community wireless networks.

## 1.1. Access to Communications in Uganda

While significant progress has been witnessed in Uganda's communications sector, attributed to increasing mobile cellular subscriptions and increasing access to broadband connectivity, access in rural and underserved areas remains a challenge. This is largely due to well-known challenges common to African countries including lack of access to communications infrastructure, lack of energy sources for users and for powering up the Information and Communications Technology (ICT) infrastructure, expensive communication infrastructure, and the high tariffs associated with ICT services and applications. Furthermore, Internet awareness is low—a 2006-2007 study found that less than 10 percent of the surveyed population in Uganda knew what the Internet is (Organisation for Economic Co-operation and Development, 2009). Figure 1 shows the slow but steady growth of Internet users in Uganda. It is also clear that mobile/wireless options for connecting to the Internet are the more practical option given the limited fixed line infrastructure in Uganda (UG) and across Sub-Saharan Africa (SSA) based on statistics from the International Telecommunication Union (ITU).

The low Internet penetration rates and high tariffs are primarily due to a lack of high-capacity international networks. Having multiple cables along the Eastern coastline as highlighted in Figure 2 should not only bring down prices, but should also serve to provide multiple options for countries and remove their reliance on any single network—satellite or cable. The cables are also significantly increasing the capacity available for Internet connectivity, as profiled in Table 1.

*Figure 1. Trend of ICT usage in Uganda and in Sub-Saharan Africa (Source: ITU)*