

# Chapter 11

## Challenges and Opportunities of ICTs for Rural and Remote Areas

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### ABSTRACT

*Broadband Internet access is important for rural and remote areas to access e-commerce, e-government, e-learning, e-healthcare, Internet telephony, and other online resources. This chapter discusses the main opportunities and challenges of developing telecommunication infrastructures for rural and remote areas. In addition, affordable high-speed Internet access is important for communication (voice, data, Internet, etc.), community empowerment, job search and career development, and weather and climate monitoring. Expanding Internet access to rural areas, in particular, faces a number of challenges, such as lack of sustainable and affordable power supply, limited funding opportunities, and selecting a suitable technology. The authors discuss these issues using anecdotic evidence from a number of projects and case studies developed in the last 30 years by International Telecommunication Union (ITU). They conclude the chapter with recommendations of successful practices and policy guidelines.*

### INTRODUCTION

The International Telecommunication Union (ITU)<sup>1</sup> is the agency of the United Nations responsible for Information and Communication Technologies (ICTs). In particular, it strives to provide ICTs to underserved and rural communi-

ties all over the world, allocates radio spectrum and satellite orbits worldwide, and develops network standards to ensure seamless interconnection. ITU is committed to include all people in the information society and to support the rights of people to communicate. In other words, one of its objectives is to remedy the imbalance of telecommunications

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between “haves and have-nots” in both developed and developing countries. For that purpose, ITU established the Telecommunication Development Sector (ITU-D) which is responsible for:

1. Assisting member countries in accessing and mobilizing technical, human and financial resources needed for the implementation of ICTs and promoting access to their service;
2. Working on bridging the digital divide;
3. Promoting the extensions of the benefits of ICTs to all human beings; and
4. Developing and managing programs that facilitate information flow geared to the specific needs of developing societies.

Its efforts go back to almost 30 years. In particular, the United Nations General Assembly chose 1983 as the “World Communications Year.” This was when the ITU established the Independent Commission for World-Wide Telecommunications Development chaired, by Sir Donald Maitland. Later it is called Maitland Commission, which issued the famous “The Missing Link Report” or “The Maitland Report” in January 1985 (Maitland Commission, 1985). The report identified the communications gap between developed and developing countries. The target set in the report was that by the early part of the 21st century virtually the whole humankind should be brought within the easy reach of a telephone and of all the benefits it can bring. Since then, higher investment in telecommunication has been allocated, coupled with the emergence of new technologies and innovative strategies, as well as the general understanding of the socio-economic effects of communications infrastructure, have led to a remarkable degree of telecommunication development observed in most of developing countries throughout the 1990s. Whereas the goal set in the Maitland Report is deemed to be a realistic and achievable target, the progress of digital technologies, and the proliferation of

Internet related services and applications have brought to us new challenges.

A new goal namely to connect all humankind on this planet was set by 2015 through two phases of the World Summit on Information Society (WSIS) 2003 in Geneva and 2005 in Tunis. In the meantime the World Telecommunication Development Conference in 1998 (WTDC-98, Valletta, Malta) decided to create a Focus Group on topic 7 (later it is called FG7) to identify new technologies designed to fulfill the needs of developing countries and to tackle the issue, particularly in rural and remote areas. The final report entitled “New technologies for rural applications” was published in February, 2001 by the ITU (ITU-D Focus Group 7, 2001). The report highlighted emerging technologies suitable for use in rural and remote areas. It also identified potential applications for tele-education, tele-medicine, development of small businesses, emergency support, disaster relief and environmental monitoring, etc. It concluded that wireless networks, combined with packet-based Internet Protocol (IP) networks can be used in rural and remote areas of developing countries because of its cost effectiveness, fast roll-out time and capability of affordable and sustainable multimedia services. In addition, the report includes recommendations such as creating a handbook for renewable energy and small-scale power systems for rural ICTs. ITU’s challenge to tackle the rural ICTs development issues was succeeded by the ITU-D SG2 Rapporteur’s group on Q10 “Telecommunications/ ICTs for rural and remote areas” since 2002 (ITU-D SG2, 2004). During three study cycles (each one is four years), it conducted global survey on the status of telecommunications in rural and remote areas. It also collected case studies, issued analytical reports, established library of cases on the website of ITU-D<sup>2</sup>.

The following are the key issues identified from the 60 case studies:

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