


## Chapter 8

# Application of Geoinformation Technology to the Management of Community-Based Natural Resources for Tourism Development in Northern Tanzania

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### ABSTRACT

*The approaches to natural resources management have evolved. Disparities in their adoption are likely to produce a long-lasting negative impact on the resources and the livelihood security of the community depending on them. The use of geoinformation by the local community is a critical measure to the sustainability of its resources. Nonetheless, the application of geoinformation technologies to the community-based natural resources for the tourism industry is highly unknown. This chapter reviewed the application of geoinformation technology to the management of community-based natural resources in the Pangani District of Northern Tanzania. It considers how geoinformation technology is used in the management of tourism activities for community development. Specifically, the chapter discusses community developments resulting from that as well as challenges associated with the use of geographical information systems and remote sensing technologies. The chapter concludes with key recommendations for improving those challenges.*

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## **BACKGROUND**

The application of geoinformation technology for socio-economic development and management of natural resources in particular has been on the increase in most parts of the developed world. However, it remains exceptionally challenging in developing countries. Studies by Azzari et al. (2013), Pena-Regueiro et al. (2020), Sebastián-Frasquet et al. (2014), and Sumari et al. (2018) show the relevance of geoinformation technology, such as Geographic Information System (GIS) and Remote Sensing (RS) in geodata collection, analysis and planning, fostering economic development, improving health, and in mitigating conflicts in various parts of the world. Studies by Kumar et al. (2015), Quan et al. (2001), Rahman (2010), Turk & Gumusay (2004), and Verka & Angelina (2008) show that RS and GIS have been used in many areas of the tourism sector including - planning, digital mapping, showing data trends, and logistics, among different uses. In Tanzania, the technology has been used in several sectors of the economy such as in the population census by NBS (2013), tourism management and in the land revenue collection. In relation to the management of natural resources for instance, a study by Kironde (2009) shows that GIS and RS have been used in land surveys, registration, transfer of land rights and/or transaction, and land dispute resolution mechanisms. However, despite the benefits, little is known about the application of geoinformation technologies in the management of community-based natural resources for tourism and community development at the village level. This chapter relies mainly on the literature to investigate how geoinformation technology is used for the management of community-based natural resources for tourism development. Specifically, it discusses community developments resulting from that as well as challenges associated with the use of GIS and RS technologies. The review is within the context of rapid advances in geoinformation technology. The chapter concludes with recommendations for improving the utility of GIS and RS technologies for tourism development in Pangani district.

Community-Based Natural Resources Management (CBNRM) is the governance initiative of integrating local community into the management of the environment with the aim of meeting cultural, social, and ecological goals at the local level (Agrawal & Gibson, 1999; Yeatman, et al. 2003). In the early stages, CBNRM was highly pushed by development partners through a neo-liberal approach of reducing state control and influence on natural resources. Worldwide, since 1990s, a number of global, regional and local efforts aiming to promote CBNRM in forests, water, fisheries, and land have been recognised with policy changes. Holden et al. (2014) and Kellert et al. (2000) insist that CBNRM have to balance ecology, economy and cultural goals. For instance, in Nepal, community Water Users Group (WUG) and Forest Users Group (FUG) have been used over 30 years for managing irrigation systems and forests, respectively (Pant et al., 2005). In Malawi, co-management is

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