Chapter 4
Geo-Spatial Technology for Land Resources Management in Nigeria

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ABSTRACT

There is little discussion regarding natural resources management issues in Nigeria, unlike many other places around the world, where such issues have made significant contributions to research growth. This is a troubling situation that complicates Nigeria's present need to address her increasing sequence of aggravations related to land cover modifications. Sustainable use of land, water, solid minerals, and forest is difficult and overwhelms local efforts. Demographic pressures and the corresponding need for developments and societal livability have a proclivity to overuse land resources and impact negatively on their present quality and future regeneration. Traditional and indigenous approaches are still the bases of natural resources management. The cumulative challenges of these issues with other prevalent anomalies are increasingly compromising Nigeria's land resources base. However, geo-spatial technology with its potential for policy and decision-support is being set forth to address these challenges and to fill the current gaps in knowledge of natural resources management.

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INTRODUCTION

Of the natural resources in Nigeria, land, specifically soil, is over-stressed by several factors—human, climatic, ecological and biological. In the south-eastern part of Nigeria, gully erosion threatens the soil, leading to a loss of major nutrients for agricultural purposes. For the northern region, desert encroachment is fast taking over the vegetative characteristics and changing local hydrological design (Akpodiogaga-a & Odjugo, 2010). Within Lagos state, and most places within the south-western and north-central regions of Nigeria, flooding is a major problem creating ever more vulnerable areas and more water-logged soil which are so overwhelming for human liveability and other purposes. The cost of oil exploration on the land resources within the Niger delta cannot be more obvious. The vast majority of the land resources within the region are no longer useful for farming, fishing, and other socio-economic activities. Therefore, debates have increased over land and environmental management in the area. Nkwunonwo *et al.* (2019) argued that the soil is a fundamental factor in the Fulani-herdsmen-farmers conflicts that have become perennial and intractable in the northern part of Nigeria. Although there is no validation of the argument as yet, it is an undeniable fact that soil in the northern part of Nigeria is fast losing its potential to support animal grazing, forcing herdsmen within the region to roam about in search of grazing lands. This condition has caused and still causes tension for agriculture and other development purposes, but it is also a major issue of dialogue for research and environmental governance.

More than ever, we need research to come up with ways to assuage the difficulties with soil in Nigeria and to increase its availability for food security and other agro-based activities. Researchers in pedometry and soil science have done ample work, for example, Vanlauwe et al. (2005), Nkwunonwo & Okeke (2013) and Mashi & Shaibu (2018). However, those works lack the foundation of current natural resources management, which is sustainable development and environmental protection (example: Sharma & Shivakoti, 2017). A realistic management of land resources should highlight a culture that affords land resources the opportunity to contribute towards achieving man's existential purpose. This culture also embraces the ability to address environmental issues such as erosion, flooding, gas flaring, pollution, urban heat and noise, whilst maximizing the usefulness of land resources. It is an integrated culture in the sense that it finds expression in many other fields of knowledge involving the soil.

The UNDP-Nigeria collaboration (*Agenda 21*), which focused on the institutional aspects of sustainable development based on five core areas: (1) Integrated decision making, (2) major groups, (3) science, (4) information and (5) international law, has made some strides at advancing the course of natural resources management in Nigeria. In view of land resources management, one critical achievement of