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Population driven changes in land use in Zimbabwe's Gutu district of Masvingo province: Some lessons from recent history

Hamisai Hamandawana*, Musisi Nkambwe, Raban Chanda, Frank Eckardt

Department of Environmental Science. University of Botswana, Post Bag 00704 Gaborone, Botswana

Abstract

A hybrid approach comprising literature review, field investigation and interpretation of multi-date panchromatic aerial photographs at the 1:25,000 and 1:50,000 scales over four time slices between 1963 and 1997 was used to investigate the environmental impacts of increasing population density in Zimbabwe's Serima communal lands of Gutu district in Masvingo province. Results indicate deteriorating environmental trends in the form of deforestation, increased soil erosion, decline in grazing resources and extension of arable land into marginal areas. With high population density initiating unsustainable land use practices, relieving population pressure through land redistribution promises to offer long-term alternatives.

Keywords: Population density; Environmental deterioration; Long-term trends

Introduction

One of the major problems confronting sustainable natural resource management (NRM) in Zimbabwe's communal areas (CAs) is degradation of the environment (Chenje, Sola, & Paleczny, 1998; Du Toit & Campbell, 1989; Hamandawana, 2002; Moyo et al., 1991; Whitlow, 1985, 1980) due to population densities in excess of the land's carrying capacity (Whitsun Foundation, 1983). High population pressure and limitations imposed by ecological constraints have produced land-use practices associated with environmental

* Corresponding author. Fax: +267 585 097.
E-mail address: hamandawanah@hotmail.com (H. Hamandawana).

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degradation (Beinart, 1984; Moyo, 1995; Phimister, 1986). Over cultivation of land unsuitable for intensive cropping and non-rotational grazing under increasing livestock numbers have induced severe soil losses from erosion (Elwell, 1974; Elwell & Stocking, 1988; Stocking, 1983; Stocking & Elwell, 1973; Whitlow, 1988a,b). While increasing crowding appears to be the main driving force behind deteriorating conditions poverty, and restricted options for alternative sources of livelihood add to the problem by forcing people to overexploit natural resources for basic subsistence requirements (Chenje et al., 1998, 47).

Though the relationship between increasing crowding and resource degradation has long attracted the interest of many researchers, there is conspicuous absence in the literature of recent studies devoted to long-term trend analysis. Most of what is available is fairly dated, creating a gap in terms information availability. Where attempts have been made to bridge this gap, the tendency has been to summarize already existing information. Though what is available admittedly offers invaluable insights, this study goes a step further in attempting to bridge this gap by employing a methodology that taps on both existing literature and remotely sensed data the underlying premise being that; where natural factor endowments prohibit intensive land utilization, high population densities tend to induce deteriorating trends in the state of the environment. For this reason, we selected Serima communal area because it provides opportunities to investigate how convergence of increasing crowding and ecological constraints allows the former to fast-forward downward trends under natural conditions due to resource overuse.

Geographical setting of the study area

The study area (Serima CA) is located in the northern part of Zimbabwe's Gutu district in Masvingo province (Fig. 1).

Climatically, the area falls under Natural Region III. Natural Regions (NRs) in Zimbabwe's context are areas delineated on the basis of soil type, rainfall and other climatic factors (CSO, 1997, 144). Table 1 shows the main characteristics of Zimbabwe's five NRs.

Soils in Serima communal area are predominantly coarse-grained sandy loams ranging in depth from shallow to deep with low organic and mineral nutrients (Anderson, 1993), negligible proportions of clay and silt fractions, poor water retention capacity and friable characteristics that make them susceptible to erosion (Stiltz & Weyel, 1986). The area's climate is mainly driven by unreliable and extremely variable rainfall with a 39% coefficient of variability (Stiltz & Weyel, 1986) and unbalanced distribution. On average, about 56% of total annual amount is received during the first half of the rainy season between late October and mid February (Sengayi, 1991) with pronounced inter-annual variations (Fig. 2), prolonged mid-season dry spells and erratic distribution that often lead to severe drought and total crop failures.

The entire district (comprising 12.5% of Masvingo province) covers 7079.42 km^2. Its population (196,000 in 1992) increased by slightly over 1% to about 198,000 in 2002 (CSO, 1992, 2002) giving a nearly constant population density of 28 people/km^2 for the entire decade. Though this density is modestly low compared to other districts, population density in CAs is in excess of 50 people/km^2 because of a skewed distribution of land that