

Research Application Summary

**Spatial and temporal distribution of fallow land and its utilisation in southeast Zimbabwe**

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**Abstract**

Since the attainment of national independence in 1980 land distribution has dominated if not defined the agrarian debate in Zimbabwe. However, evidence of increasing hectareage of fallow land in communal lands, where 70% of the population resides, against a backdrop of professed landlessness, presents a paradox that must be analysed. The present study aims to assess the spatial and temporal changes in fallow land distribution and its utilisation in communal areas, and is part of a bigger study on exploring potential strategies to enhance productivity of fallow land in communal areas. The study is being conducted in ward 28 of Chibi district that is located in the southeastern part of the country, which typifies many communal areas of semi-arid Zimbabwe. A combination of technical and participatory research methods are being used to determine trends in the distribution and utilisation of fallow land. There are no results as yet as the research is just beginning. It is, however, expected that fallow land will be shown to have increased in the last 30 years due to a combination of decreasing soil fertility and socio-economic factors, and is increasingly being used for grazing whose quality can be enhanced by introducing legumes.

Key words: Demographic changes, fallow land, soil fertility, spatial and temporal distribution

**Résumé**

Depuis la réalisation de l'indépendance nationale en 1980, la distribution des terres a dominé, si elle n'a pas défini, le débat agraire au Zimbabwe. Toutefois, la preuve de la croissante de la superficie de terres en jachère des terres communales, où 70% de la population réside, dans un contexte de manque de terres apparent, présente un paradoxe qu'il faut analyser. La présente étude vise à évaluer les changements spatiaux et temporels dans la distribution des terres en jachère et son utilisation dans les espaces communs, et fait partie d'une plus grande étude sur l'exploration des possibilités et des stratégies pour améliorer la productivité des terres en jachère dans les

zones communes. L'étude est menée dans le quartier 28 du district de Chibi qui se trouve dans la partie sud du pays, qui caractérise de nombreux espaces communs de la zone semi-arides du Zimbabwe. Une combinaison de méthodes de recherche participative et techniques sont utilisés pour déterminer les tendances dans la distribution et l'utilisation des terres en jachère. Il n'y a pas encore de résultats car la recherche ne fait que commencer. Il faut, cependant, s'attendre à ce que les terres en jachère soient démontré qu'ils ont augmenté au cours des 30 dernières années en raison d'une combinaison de baisse de la fertilité des sols et des facteurs socio-économiques, et est de plus en plus utilisées pour le pâturage dont la qualité peut être améliorée par l'introduction de légumineuses.

Mots clés: Les changements démographiques, les terres en jachère, la fertilité des sols, la distribution spatiale et temporelle

## Background

Land distribution has dominated if not defined the agrarian debate in Zimbabwe since national independence in 1980. At the centre of the debate was the morality of a white minority population (<1%) utilising 11 million ha of the country's prime agricultural land while 60-70% of the national population, resident in rural areas known as communal lands (CAs), have access to only 16.4 million ha of poor quality land (Moyo, 2006) that does not support for both crop and animal production. Increasing areas of land being left fallow in communal areas, due to combination of decreasing soil fertility and demographic changes, against a background of professed landlessness, presents a paradox which needs to be analysed. This study aims to assess the spatial and temporal changes in fallow land distribution and utilisation in communal areas where 70% of the population resides, and is part of a bigger study on exploring potential strategies to enhance the productivity of fallow lands in communal areas.

## Literature Summary

Use of natural fallows is an old practice of allowing soil fertility regeneration, disease control and rejuvenation of soil structure (Nyamadzawo *et al.*, 2003; Nezomba, 2009). However, increases in population pressure and land scarcity have caused farmers to continuously cultivate the same pieces of land resulting in the soils losing the ability to quickly regenerate (Mapfumo and Giller, 2001). Farmers have responded by abandoning such fields, which combined with socio-economic factors, have resulted in increasing hectareage of fallow land (Waddington *et al.*, 1998).

Most fields that are abandoned by farmers are left to regenerate naturally, which takes longer (Nezomba, 2009). This has prompted researchers to search for solutions to improve the productivity of fallow land. The bulk of the research on fallows in Zimbabwe has focused on assessing different legumes such as indigenous herbaceous and tree legumes (Chikowo *et al.*, 2003; Zingore *et al.*, 2003; Chikowo, 2004; Mapfumo *et al.*, 2005) as sources of soil fertility and animal feed, and soil and water conservation (Nyamadzawo *et al.*, 2003). In general the results were positive although adoption was poor. The limited attention paid to investigating the relationship between fallow land and livestock production contributed to poor adoption. Most CAs are found in semi-arid areas that are more suited to livestock rather than crop production (Muir-Leresche, 2006).

There is a paucity of information regarding to the spatial and temporal distribution and utilisation of fallow land and the underlying bio-physical, environmental and socio-economic factors. Locating the phenomenon of fallow land within the wider context of land use change in communal areas is an important step in planning and sustainable land utilisation, which is critical to meet the increasing demand for land for basic human needs and welfare (Kusangaya *et al.*, 2004).

### **Study Description**

The study is being undertaken in Chibi district, which lies some 400 km south-east of Harare, Zimbabwe's capital. It receives an average annual rainfall of <450 mm, and is one of the driest districts in the country. The soils are predominantly sandy and are characterised by low fertility (Nyamapfene, 1991). As a consequence crop productivity is very low in most seasons. The main recommended farming activity is livestock production, which however has been hampered by, among other things, shortage of good grazing. Increasing fallow land may represent a chance to address this problem.

### **Research Application**

The research is being undertaken in ward 28 in three out of the seven villages. A combination of technical and participatory research methods are being used to determine trends in the distribution and utilisation of fallow land. Remote sensing, including aerial photographs, satellite images and google earth, will be used to map land use patterns in the study area in the last 30 years. This will be used to support biophysical and socio-economic data that will be collected (Rindfuss and Stern, 1998). Parameters such as land-cover change including vegetation species diversity and composition as well as soil fertility status

and soil texture will be measured. Satellite images will be analysed to give overview of land use patterns according to variability of utilisation, and will give an indication of spatial variation in land cover types. Land use categories such as cultivated area, bare areas, fallow fields, wooded grasslands, water, woodland and grassland will be identified. Normalized Difference Vegetation Index (NDVI) will be calculated to determine changes in vegetation cover including species composition.

The above approach will be complemented by a number of participatory methods and techniques. Key informants, and focus group discussions and life histories will be used to identify current land use, perceived changes in agriculture productivity and changes in fallow land distribution, and the possible causes. Community natural resource maps will be used to show the distribution of resources in the area, location of homesteads, fields, schools, water sources and others. Transect field walks will be used to verify important points on the maps. The areas indicated on the maps will be identified on the field and actual coordinates will be recorded using a global positioning system (GPS). A questionnaire survey will be administered to 30 households in each of the three study villages to establish land use changes. Selected fields will be georeferenced and characterized in terms of soil quality and vegetation composition. GIS will be used to integrate, manipulate, manage, analyze and visualize geographic land use data.

### **Expected Output**

The study is expected to generate information on land use change in the study area detailing extent, distribution and utilisation of fallow land and the underlying reasons.

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