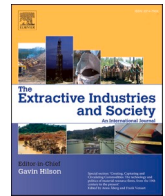


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Original article

Projected land use change in an oil-rich landscape in Uganda: A participatory modelling approach

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ABSTRACT

The discovery of oil in the North Albertine Rift Landscape of Uganda has increased pressure on land and heightened the potential for resource use conflict. In this article, we focus on changing land use dynamics as oil extraction unfolds in a new resource frontier. We ask how the development of the nascent oil industry will affect land use dynamics, including land use conflicts. This leads us to identify the land use change already arising and to use this as the basis for participatory modelling of projected change. Given they are dominant forms of land use, agriculture and forestry are central to our analysis. Design of the methodology combined remote sensing with innovative modelling incorporating participatory development methods. This facilitated insight into projected land use patterns, and specifically relationships between small-scale food production, commercial sugarcane production, and forestry conservation adjacent to settlement areas. Our data show that ill-defined land boundaries and an aggressive sugarcane out-grower scheme are avenues for so-called land grabbing. Modelling scenarios under both the status quo and under oil extraction suggest the land area covered by sugarcane production will increase at the expense of food crop farming. Given a context where forestry conservation is an important form of land use, we also consider the implications of local agricultural change on land reserved for conservation. Overall, our modelling indicates that in accounting for land use change within the resource frontier associated with oil extraction, there needs to be insight into the intricate interconnections between different forms of rural land use as future change unfolds. Understanding how oil extraction effects rural land use patterns holds relevance for planning in contexts of the Global South where new oil industries are emerging. Innovative methodologies for teasing out these complex land use dynamics can aid planning that seeks to anticipate and reduce land use conflict and support agricultural livelihoods.

1. Introduction

The extraction of oil within African resource frontiers stimulates new territorial and spatial dynamics. Writing on the Niger Delta, a context deeply entwined with oil since its discovery in the 1950s, [Watts \(2004\)](#) explores how 'petro-capitalism' produces governable and ungovernable spaces, which he argues becomes associated with specific forms of conflict and violence. Presenting a view of unconstrained global corporations and reduced states, [Ferguson \(2006\)](#) takes issue with this perspective, instead proposing an 'Angolan model' of mineral (oil)

extraction, based on a mercantile enclave largely separated from local economy and society. In recent work, [Watts \(2021\)](#) counters Ferguson's notion of the mineral enclave by focusing on the multi-scalar spaces of oil and gas extraction and examining how scalar dynamics are (re)-produced through the circulation of oil capital and state territorial power. This debate - and a wealth of literature on oil in Africa (e.g., [Heilbrunn, 2021](#)) - draws attention to the question of how local economies and societies become reconfigured by oil extraction. In rural Africa, where people are dependant on agricultural production for livelihoods, the relationship between oil industry development and land

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