Land consolidation in Kenya: An *ex-ante* evaluation of benefits, costs and risks

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Abstract

Land consolidation has been proposed by scholars and policy-makers as a means to halt land fragmentation, increase productivity, and to create youth employment in Kenya. Agricultural policies are, however, characterised by risks and uncertainties, which can reduce their efficacy and success rates. Complex socioecological interactions and data scarcity make it difficult to use standard approaches of evaluation and planning. To overcome these challenges, we use decision analysis, an interdisciplinary approach suited for data-scarce and complex environments, to support decision-making of land consolidation in Kenya. To evaluate whether land consolidation would be an effective policy measure to achieve its aims, we used experts' knowledge elicitation to build impact pathways of land consolidation intervention and considered benefits, costs, and risks that experts considered important for intervention success. Model input data, that expressed the uncertainty of all variable in the form of probability distributions, were collected from fifteen experts after subjecting them to calibration training and from literature. We then used a Monte Carlo based simulation to project outcomes and identify important and critical variables. Our model results predict that while land consolidation is likely to boost agricultural productivity, it will have negative effects on youth employment and biodiversity conservation. The intervention costs and negative externalities are also likely to exceed the overall benefits of land consolidation. Key risks included rural populace reluctance to participate in the intervention and political interference. Important uncertainties involve the impact of larger field patch sizes on changes in agrodiversity due to higher degree of mechanisation and agricultural intensity. Our findings underscore the trade-offs of land consolidation, including potential impacts on agricultural productivity, youth employment, and biodiversity conservation. By integrating decision modelling and stakeholder involvement, our research offers valuable insights into the prospective effects of land consolidation interventions for governments in their planning and prioritisation of investments for rural development.

Keywords: Agricultural policies, biodiversity conservation, decision analysis, food security, stakeholders

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