

**Job Kihara Maguta**

ZEF Ecology and Development Series No 66

## **Conservation tillage in Kenya: the biophysical processes affecting its effectiveness**

Appropriate soil management improves ecosystem functioning and crop yields. The extent to which conservation tillage improves soil health under smallholder conditions is not well known. This study investigates how tillage, crop residue and cropping systems affect soil structure, microbial diversity, fauna activity, N-fixation and crop productivity. Practicing reduced tillage results in higher soil macroaggregation and N-fixation, different microbial community compositions, and similar maize (after 3 years) and soybean yield relative to conventional tillage. Integrating legumes in the system increases soil macroaggregation and microbial diversity (e.g., in intercropping), and results in greater net benefits than in continuous maize cultivation. It is concluded that on the Ferralsols of the sub-humid tropics in Kenya, adoption of conservation tillage practices would be beneficial to smallholder farmers and the environment in the long run.