



Why Market Access and Land Tenure can Boost Agricultural Productivity


A Soil Conservation Study from Kenya

Abstract

This CEEPA study from Kenya analyses the role of market access and land tenure security on both soil conservation and crop productivity in Kenya.

The study finds that poor market access and land tenure insecurity hinder the adoption of soil conservation strategies and adversely affect agricultural productivity. The results also confirm the positive impact of soil conservation strategies on agricultural productivity. The study is based on 793 plots from a sample of 528 households drawn from the Mbeere and Machakos districts of the Eastern Province of Kenya. A community and household survey was used to collect the main information used in the study.



The results point to a number of important issues for policy makers. It is clear that, if agricultural productivity is to be enhanced, then it is important to open up remote areas. It is also vital to equip farmers with information on the land conservation technologies and farming systems that are suitable for their plots. The study also shows that providing broad incentives for the adoption of soil conservation strategies, improving living standards and enhancing social capital will enhance crop productivity. 

Kenyan farmers can benefit from better market access.

A summary of CEEPA Discussion Paper No. 7: 'Soil Conservation and Crop Productivity in Kenya: The Role of Institutional Isolation', by Jane Kabubo-Mariara (Ph.D). School of Economics, University of Nairobi, P.O Box 30197, 00100, Nairobi.

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Report Summary

In many parts of Africa farmers do not have good access to markets for their produce. Many also face insecurity in the tenure they have over their land. These challenges are often referred to as problems of institutional isolation and decay. It is clear that such problems can undermine farmers' attempts to accumulate assets, invest in land improvements or adopt soil conservation practices. For example, farmers who live in remote areas often face high costs obtaining and transporting the agricultural inputs they need. As a result, they postpone necessary farm improvement work. This means that cropping intensities suffer, farm production declines and net economic returns are diminished. These problems can also lead to a gradual degradation of the natural resource base. Despite the significant challenge that these problems present, they have not been the subject of any major African studies. Now, this new CEEPA study from Kenya has made an important contribution to filling this information gap by analysing the impact of institutional isolation and decay on soil conservation and agricultural productivity.

The study areas: Mbeere and Machakos

The study is the work of Jane Kububo-Mariara from the University of Nairobi. It was conducted in the Mbeere and Machakos districts of the Eastern Province of Kenya. Machakos is relatively accessible due to its proximity to Nairobi and the Nairobi Mombasa highway. Mbeere district is less accessible. It is located over 200 kilometres from Nairobi and most of its feeder roads are virtually impassable during heavy rains. The two districts have comparable demographic characteristics. Both have high levels of poverty. The topography and climate in the two districts is also fairly similar, as is their agricultural potential. Crop production in the two districts is diversified and farm holdings range from intensive farming on smallholdings to large company farms. Farmers grow a variety of both food and high-value cash crops. Agriculture employs about 80% and 70% of the people in Mbeere and Machakos respectively.

A wide range of primary information was collected in order to assess the impact of institutional isolation and decay. To do this, a questionnaire was designed to get details of households' demographic characteristics, their tenure security and the soil conservation strategies they had put in place. The study sought information on all forms of soil conservation efforts including inputs (such as fertilizers and manure), mulching, fallowing, agro-forestry, terracing, grass strips and the construction of soil bunds. Information was also obtained on the development domains in which farmers worked (the development domain idea encapsulates the interaction of agricultural potential, market access and population pressure). A total of 251 households from Mbeere and 277 households from Machakos districts took part in the survey. In all, 793 farm plots were covered by the survey. A community questionnaire was also conducted with selected informants in each village. This was used to supplement the information collected from households. The community survey collected data on sources of market information, market access (measured by two factors: travel time and access to market information), village infrastructure and the prices of farm inputs and livestock.

How the research areas compare

It is clear that there are significant differences in the two districts with respect to land tenure arrangements, soil type and topography, the adoption of soil conservation techniques, social capital and market access. Households in Machakos district enjoy more favourable socio-economic circumstances than those in Mbeere. There is also better market access in Machakos. Households in Machakos are better endowed in assets, have stronger land rights and participate more in social capital formation. What's more, there is higher agricultural potential in Machakos. There is no significant difference in crop productivity in the two districts.

Overall, 80% of all farm plots in the two regions had received some form of soil conservation investment. The most common types of soil conservation strategies employed by farmers were grass strips and agro forestry (on about 58% of all plots for each), followed by terracing (44% of all plots) and ridging (23% of all plots). Analysis of the data indicated that, on average, the adoption of soil conservation techniques was more widespread in Machakos than in Mbeere.

The impact of tenure security and market access

Multivariate regression analysis was used to look in more detail at the relationship between tenure security and market access and the adoption of soil conservation strategies. Overall, it is clear that tenure security and good market access boost the adoption of all soil conservation techniques and that they have the largest positive impact on the adoption of terraces and grass stripping. The results also show that the more remote a farm is, the less likely it is to adopt any soil conservation techniques.

With respect to other variables, the study finds that population density has a significant positive impact on the adoption of all soil conservation strategies. This supports the hypothesis that agriculture becomes more intensified as population density increases (this is known as the Boserupian hypothesis). The impact of development domains depends on the type of conservation strategies being employed. For example, an improvement in development domains would reduce the probability of a farmer planting trees and using grass strips but would increase the likelihood of him adopting terraces and ridges.

Distance to nearest facility (Kilometres)

<i>Variable</i>	<i>Machakos</i>	<i>Mbeere</i>	<i>Mean Difference</i>	<i>t-value</i>
Market	1.21 (0.39)	6.60 (4.21)	-5.38	-3.29***
Primary school	1.21 (0.39)	1.90 (0.80)	-0.69	-2.02**
Secondary school	1.54 (0.42)	3.20 (1.96)	-1.66	-2.20**
Health centre/ hospital	8.92 (7.50)	9.20 (5.66)	-0.28	-0.07
Dispensary	1.68 (1.52)	2.70 (2.45)	-2.15	-0.92
All-weather road	1.89 (1.49)	6.50 (9.27)	-4.61	-1.31
Public transport/bus	1.18 (0.43)	2.50 (12.22)	-1.32	-0.94
Nearest town	18.40 (9.30)	19.25 (18.33)	-0.85	-0.12

***, ** Significant at 1% and 5% respectively. Standard deviations in parenthesis.

The factors that affect crop productivity

Tenure security and market access have a significant positive impact on crop productivity. In fact, a reduction in the extent of institutional isolation by 1% would increase agricultural productivity by 22% (all other things being equal). Development domains also affect agricultural productivity, but the effect is context specific. Other factors that have a significant impact on crop productivity include the characteristics of household heads, households' asset endowments, social and financial capital, access to extension services and rainfall. The findings also underline the conclusions of many other studies that investment in soil conservation has a significant impact on farm productivity.

There were a number of differences at the district level. The adoption of soil conservation techniques and improvements in crop productivity in Machakos seem to be largely driven by institutional isolation and development domains; while in Mbeere district the key drivers seem to be the characteristics of household heads, household assets and financial and social capital.

Policy implications

Overall, the findings of this study show that institutional isolation is a key barrier to the adoption of soil conservation technologies and that it significantly affects crop productivity. It is therefore important to open up remote areas, if the welfare of farming households is to be improved. This means that the development of market infrastructure (markets, roads and social facilities) and the improvement of market information should be made a priority. Better market access would not only facilitate the adoption of alternative soil conservation techniques, it would also facilitate the adoption of purchased inputs such as inorganic fertilizer and pesticides, so boosting crop productivity. Enhancing security of tenure would also help promote long-term soil conservation investment and increase crop productivity.

The results highlight the importance of giving farmers appropriate information on land conservation technologies and farming systems; such information should be tailored to the specific domains where people farm. This information should be backed up by research into the suitability of different soil conservation strategies, inputs and crop varieties in different regions. Experiences of what works and what does not work in specific regions should be an integral part of this research and dissemination strategy.

Promoting soil conservation

The study finds that soil conservation strategies increase crop productivity. It is therefore important to provide broad incentives for the adoption of appropriate soil conservation techniques. These incentives should include access to markets, credit and extension services. It is clear that none of these incentives alone will be sufficient to make farmers put soil conservation strategies in place – instead a package of incentives should be introduced.

The characteristics of household heads (grade attainment and employment status), asset endowment and social capital affect the extent to which farmers adopt soil conservation strategies and boost crop productivity. This suggests that general policies that improve living standards, increase access to education and employment and increase household assets, will lead to more farmers adopting soil conservation strategies and that this will, in turn, boost crop productivity. Enhancing social capital and developing social cohesion and collective action will also have similar positive effects. Community-based organizations, churches, local nongovernmental organizations and other institutions should therefore be encouraged to help mobilize communities.

“ Institutional isolation is a key barrier to the adoption of soil conservation technologies. ”

Opportunities for future research

This study makes an important contribution to the literature on institutional economics by investigating the impact of institutional isolation on the adoption of soil conservation strategies and crop productivity. However, given data limitations there were some important issues that could not be covered by this study. For example, further research is needed to investigate the impact of institutional isolation on the adoption of water conservation strategies in Kenya. There is also a need for further research that incorporates crop prices, the volatility of crop prices and technological spillovers into an assessment of the impact of institutional isolation on the adoption of soil conservation strategies and crop productivity. 🌍

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Research Sponsors



CEEPA gratefully acknowledges the support provided by the key sponsors for the research summarised in this policy brief. They are the International Development Research Centre (IDRC) and the Swedish International Development Cooperation Agency (Sida). The findings, interpretations and conclusions expressed herein are those of the author(s) and do not necessarily reflect the views of the Board of Executive Directors of IDRC, Sida or our other sponsors. IDRC and Sida do not guarantee the accuracy of the data included in this work.

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