Assessment of the macro-micro linkages between rural livelihoods, agricultural research innovation systems and agricultural policy changes in Malawi

By

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Submitted in partial fulfilment of the requirement for the degree of

PhD Agricultural Economics

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(November, 2011)
DEDICATION

This work is dedicated to my mother, Professor Eta Elizabeth Banda, and my sister, Dr. Angela Chipo Ulemu Chaponda, for their never-ending support and love. You have been the giants on whose shoulders I have stood to see a little further.
DECLARATION

I declare that this thesis hereby submitted for the degree of PhD in Agricultural Economics at the University of Pretoria is entirely my work and has not been submitted anywhere else for the award of a degree or otherwise.

Parts of the thesis have been published and submitted for publications in journals.

Any errors in thinking and omission are entirely my own responsibility.

Signed: .................................

Name: Mariam A.T.J. Mapila

Date: November, 2011
ACKNOWLEDGEMENTS

First and foremost, I would like to thank God for providing me with more of everything than I have ever dreamed possible and for allowing me to undertake this study. I am indebted to the BACHOMA Family Trust Fund and to the Bureau for Food and Agricultural Policy (BFAP) for providing the financial support that enabled my studies and research.

I am thankful to my promoter, Professor Johann F. Kirsten, and my co-promoter, Dr. Ferdinand H. Meyer, for always asking the right questions, and for their tireless efforts and contributions that helped me to better focus my energy and ideas.

Appreciation should go to the communities of Katundulu, Kango and Mphamba. In addition, I would like to thank Dr Jemimah Njuki, Dr Robert Delve, Mr A. Chavula, Dr Franklin Simtowe, Mr Samuel Kazombo, Mr Frank Tembo, Mr Fredrik Msiska, Mrs Zuna Botha and all staff of Ukwe EPA for providing different kinds of assistance at various stages of the research. Gratitude also goes out to Professor A.K. Edriss, Dr M.A.R. Phiri and Mr D.D.C. Mauambeta for providing inspiration. Thanks should also be extended to Linda Kachale, Emma Chiwanda, Sylvia Thembulembu and Gift Chimimba who are true change agents and who assisted greatly in data collection.

Special thanks are also extended to Edda Siliya, Eliza Mzemela, Nasiphi Mqedlana and Bonolo Dinokopila for their friendship as well as my classmates, Goodness Aye, Gody Sanga and Olivier Mosapha. In addition, I would like to thank Alex and Mirriam Chimimba, Chifundo and Chikumbutso Chilivumbo, Harriet Gausi, Lilian Moyo, George Lwanda, Joy Lulema, the Kapowo’s (Salome, Alamu, Bennie & Wongs), Angella Ngoma, Anesu Makina, Wezi Mhango, Victor Jere, Chance Mwabutwa, Grace Tomoka, Yemene Gebrehiwet, Tinashe Kapuya and all congregational members of St. Columba’s Presbyterian church who supported me in very different but equally important ways throughout my studies.

Finally, I would like to thank mom, Ang and Mas as well as Daliso, Zara and Teyo, whose support and love have sustained me not only during these studies but since time immemorial. I am forever grateful for your love and unfailing support.
ABSTRACT

ASSESSMENT OF THE MACRO-MICRO LINKAGES BETWEEN RURAL LIVELIHOODS, AGRICULTURAL RESEARCH INNOVATION SYSTEMS AND AGRICULTURAL POLICY CHANGES IN MALAWI

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This thesis argues that the full impact of Agricultural Innovation Systems (AIS) driven research, that works to enhance not only agricultural production and productivity but also market linkages cannot be captured effectively using only micro-economic level studies; but rather requires the use of a combination of micro and macro-level analysis. This is because the innovation systems perspective entails the collaboration of different actors across the entire agricultural value chain. Therefore this study aimed to firstly quantify the degree to which AIS driven research impacts upon the livelihood outcomes of rural smallholder farmers. Second, the study aimed to determine the extent to which a combination of macro-economic and agricultural policy shocks impact upon household incomes in the maize-based farming system in Malawi; given macro-micro linkages as strengthened by AIS research.

The first objective was tackled by using quasi-experimentation with propensity score matching to establish a valid counterfactual and single differencing to measure impact. The second objective was achieved by using a combination of quantitative and qualitative statistical and econometric tools to delve into the dynamics of the maize market at different levels and to develop a model that is capable of capturing the maize market dynamics. A multi-equation partial equilibrium model of the national maize market was therefore developed and linked in a top-down unidirectional manner to the local maize economy via a price-linkage equation. A
non-behavioural arithmetic micro-accounting approach was adopted to estimate household incomes that were linked to the local economy, through which macro-economic level maize price changes transmit.

The results of the study empirically demonstrate that AIS driven research impacts positively upon the livelihood outcomes of rural households. This is demonstrated with participating households exhibiting statistically significant higher production outcomes (upland crop production, maize harvests, value of assets, and value of livestock); household incomes as well as human capital outcomes in some cropping seasons. In addition participating households also had much higher statistically significant fertilizer use prior to the implementation of the fertilizer subsidy program in the country; and statistically significant higher fertilizer use patterns for the first two cropping seasons following the implementation of the subsidy program. Participating households had greater linkages with the market economy which allowed them to take greater advantage of market incentives but which also made them more vulnerable to policy shocks. This study therefore shows that the analysis of the impacts of the paradigm shift in agricultural research towards an innovation system orientation cannot be contained at the household level, as this would lead to the formulation of inadequate policies that do not take into account the effects of greater market linkages of the rural households.

Policy implications are that increasing production and productivity and linking farmers to markets may not in itself be enough for sustained livelihood improvement, as the resultant greater linkages to the market economy may be detrimental to household livelihood outcomes in the face of uncoordinated policies. In order for the paradigm shift in agricultural research towards an innovation systems perspective to be effective in sustaining an entrepreneurial culture in rural societies in Africa, there is need to foster the diversification out of agricultural enterprises for income, while supporting productivity improvements for food security. In addition any interventions should be implemented only after systematic analysis of the potential consequences of the resultant enhanced macro-micro linkages. This would help to ensure that there is no mismatch between policies and livelihood improvement strategies.
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<tbody>
<tr>
<td>ADMARC</td>
<td>Agricultural Development and Marketing Corporation</td>
</tr>
<tr>
<td>ADD</td>
<td>Agricultural Development Division</td>
</tr>
<tr>
<td>AIS</td>
<td>Agricultural Innovation Systems</td>
</tr>
<tr>
<td>AISP</td>
<td>Agricultural Input Support Programme</td>
</tr>
<tr>
<td>AKIS</td>
<td>Agricultural Knowledge and Information Systems</td>
</tr>
<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
</tr>
<tr>
<td>BFAP</td>
<td>Bureau for Food and Agricultural Policy</td>
</tr>
<tr>
<td>CGE</td>
<td>Computable General Equilibrium</td>
</tr>
<tr>
<td>CIAT</td>
<td>International Centre for Tropical Agriculture</td>
</tr>
<tr>
<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
</tr>
<tr>
<td>DAES</td>
<td>Department of Agricultural Extension Services</td>
</tr>
<tr>
<td>DARS</td>
<td>Department of Agricultural Research Services</td>
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<tr>
<td>EPA</td>
<td>Extension Planning Area</td>
</tr>
<tr>
<td>ERI</td>
<td>Enabling Rural Innovation</td>
</tr>
<tr>
<td>FO</td>
<td>Farmer Organization</td>
</tr>
<tr>
<td>FPR</td>
<td>Farmer Participatory Research</td>
</tr>
<tr>
<td>HSD</td>
<td>Honestly Significant Difference</td>
</tr>
<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>LADD</td>
<td>Lilongwe Agricultural Development Division</td>
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<tr>
<td>MOA</td>
<td>Ministry of Agriculture</td>
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<tr>
<td>NARS</td>
<td>National Agricultural Research System</td>
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<tr>
<td>NFRA</td>
<td>National Food Reserve Agency</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>NRM</td>
<td>Natural Resources Management</td>
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<tr>
<td>PM&amp;E</td>
<td>Participatory Monitoring and Evaluation</td>
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<td>PSM</td>
<td>Propensity Score Matching</td>
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<td>RMSE</td>
<td>Root Mean Square Error</td>
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<td>SPI</td>
<td>Starter Pack Initiative</td>
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<td>TIP</td>
<td>Targeted Input Programme</td>
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