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

By

Mariam A.T.J. Mapila

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Department of Agricultural Economics, Extension and Rural Development
Faculty of Natural and Agricultural Sciences
University of Pretoria
South Africa

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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

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ABSTRACT

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

By

Mariam A.T.J. Mapila

Degree:	PhD Agricultural Economics
Department:	Agricultural Economics, Extension and Rural Development
Supervisor:	Professor Johann F. Kirsten
Co-supervisor:	Dr. Ferdinand H. Meyer

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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LIST OF ACRONYMS

ADMARC	Agricultural Development and Marketing Corporation
ADD	Agricultural Development Division
AIS	Agricultural Innovation Systems
AISP	Agricultural Input Support Programme
AKIS	Agricultural Knowledge and Information Systems
ANOVA	Analysis of Variance
BFAP	Bureau for Food and Agricultural Policy
CGE	Computable General Equilibrium
CIAT	International Centre for Tropical Agriculture
COMESA	Common Market for Eastern and Southern Africa
DAES	Department of Agricultural Extension Services
DARS	Department of Agricultural Research Services
EPA	Extension Planning Area
ERI	Enabling Rural Innovation
FO	Farmer Organization
FPR	Farmer Participatory Research
HSD	Honestly Significant Difference
IFPRI	International Food Policy Research Institute
LADD	Lilongwe Agricultural Development Division
MOA	Ministry of Agriculture
NARS	National Agricultural Research System
NFRA	National Food Reserve Agency
NGO	Non-Governmental Organization
NRM	Natural Resources Management
PM&E	Participatory Monitoring and Evaluation
PSM	Propensity Score Matching
RMSE	Root Mean Square Error
SPI	Starter Pack Initiative
TIP	Targeted Input Programme