

ECONOMETRIC ANALYSIS OF THE WELFARE EFFECTS OF COMMON PROPERTY RIGHT FORESTRY PROGRAMS

by

Dambala Gelo Kutela

Submitted in partial fulfilment of the requirements for the degree

Doctor of Philosophy (PhD) in Economics

in the Faculty of Economic and Management Sciences

UNIVERSITY OF PRETORIA

Study Leader: Professor Steven F Koch

Co-leader: Professor James N Blignaut

OCTOBER 2011

Dedication

To my late mother Dabo Edema- for her irreplaceable love and caring



Declaration

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

Signed:.....

Name : Dambala Gelo Kutela

Acknowledgement

Many people and institutions, in one way or another, have contributed towards materialisation of this thesis work. First and foremost, I am extremely indebted to my main supervisor, Professor Steven Koch, for his scholarly guidance, academic rigor, patience and understanding. His constructive critiques, which made me think twice at each step, not only have improved the overall quality of this piece of work, but also taught me that stepping back and thinking deeper are rewarding steps in doing rigorous academic research. Despite his busy schedule, he has always made time to read through, edit and discuss over my research ideas- often written with poor English. His kindness, keen interest and commitment for completion of my doctoral study have remained a constant sources inspiration to push my research work forward. I should say working with him has been of extremely valuable experience.

I would also like to thank my co-supervisor, Professor James Blignaut, for his contribution, particularly to fix research ideas and comments during my field research. The thesis has also benefited from comments and discussion in our mini-seminars of Thursday morning at the Department of Economics, organized for graduate students working under supervisor-ship of Professor Steven Koch. In this regard, I would like to thank Professor Steven Koch, Abebe Damte, Chitalu Chama, Gauthier Tshiswaka-Kashalala and Naomi Tlotlego.

I would like to extend words of thanks to Centre for Environmental Economics and Policy in Africa (CEEPA) for kindly granting me scholarship for the first three years of my study. In this regard, I sincerely thank and appreciate Professor Rashid Hassan and Ms Dalene du Plessis for their remarkable support. My words of appreciation are

also due to Environment for Development Initiatives (EfD) for generous financial support of field research in Ethiopia. In connection to this, Dr. Alemu Mekonnen helped coordinate the data collection and created a pleasant working environment, for which I am highly grateful. Moreover, I would like to express my sincere thanks to field research enumerators and supervisors for meticulous work of data collection. I am also deeply grateful to open-handed sample household farmers for their willingness and kindness to take sizable time off their works to complete our considerably long survey questionnaire. I would still like to express my gratitude and appreciation to Hawassa University for giving me study leave and family support grant. I would acknowledge and appreciate financial support from Department of Economics, University of Pretoria, through granting me research assistantship position during this final year, which critically helped me complete the study. Special words of thanks go to Prof van Heerden, Prof van Eyden, Ms Marita, Ms Sonja, Ms Louis and all faculty members at the department for their help in one way or another. I am also grateful to Environmental Economics Unit of Department of Economics, Goteborg University, Sweden, for hosting me to take part in specialized PhD courses, which laid theoretical and empirical foundations for some of the chapters of this thesis. In this regards, my sincere gratitude goes to Professor Fredrik Carlsson, Professor Gunnar Kohlin, Professor Thomas Sterner and the course co-coordinator, Ms Elizabeth Foldi.

During my stay at University of Pretoria, over the last four years, I have been blessed to have received considerable kindness and assistance from many remarkable people, both here in Pretoria and back home in Ethiopia. Solomon Ayalew, my brother in-law, and his family have been constant source inspiration and encouragement. Mr.

Kora Tushunes's kindness and hospitality of his family during my frequent field visits in Jimma, western Ethiopia, deserves special mentioning. I sincerely appreciate my long-time friend, Solomon Soro, for his kindness, wholeheartedness and looking after many of my family issues back home in my absence. Words of thanks are also due to colleagues; Dr. Ferdu Azerefegne, Dr. Yiberah Beyene, Dr. Berhanu Nega, Adane Hirpa, Dr. Waktole Tiki and Dr. Getaw Tadesse and "gashe" Woldemariam for the friendship and fun we had during my field work. At this point, I should thank my friend Nigusie Tefera for stata help and his kindness. I have also been blessed to have known and be friend to many people here in Pretoria: big smiles from faces of Sindi Magwaza and Elma Carlson and their helpfulness in matters related to graduate studies and Josine's humour have, indeed, been a treat to cherish. I should also thank my friends and fellow Ethiopian students at UP; Habtamu, Mihretu, Belete, Berhanu, Mulatu, Dawit, Hiwot, Abebe, Yibeltal, Wolday, Dr. Geremew, Dr. Yibekal, Dr. Wubetu and all, who are not listed here, for the social environment and funs whenever I take off for a little breather away from academics. Special thank goes to Dr. Yemane for his encouragement and review of couple of my thesis chapters. I enjoyed a warm friendship and extended discussions over various economics topics with Dr. Wisdom, Dr. Albert, Mariette and Dr. Roula at UP-I appreciate your open-mindedness and friendship!

I owe my parents and siblings so much profound gratitude for helping me get this far- especially my late mother Dabo Edema, who passed away shortly before I start my doctoral study. Mom! you treasured a lot in me, but left me before you see this turning point in my life. I would imagine how much both us would have been delighted if you could witness this success story. I dedicate this thesis to you for your irreplaceable

love and caring. I would also thank my father, Gelo Kutela, who showed me the value of hardworking and invested in my education out of his meagre resources.

Finally, to my wife, Tiruwork Ayalew and sons, Ebenezer (Abush) Dambala and Jonathan Dambala; you are special! Tiru work (ema)! your love, prayer, encouragement, patience and commitment to shoulder our family responsibilities were shingles to climb the ladder. I understand that it has been trying time for all of us (especially Joni has been perplexed by absence of his father for quite longer time).Joni and Abush! thank you for your love and patience- I always remember your warm hugs during my rare occasions of coming home! I hope at some stage, you will realize that it is not because I am not a caring father that I have been away for such long time; it is rather because I should do so for our common good. To all of you! I promise that it is time for me to join you and make headway into our family life a head. And, in fact, I dearly love you all!

I should also take this opportunity to express my sincere gratitude to Getahun, Adey, Hewan, Anteneh, Utura, Kortu, Tirunesh (Godeyo), Galgalo, Girma Getachew, Tiru-Girma, Kidist, Esey, Birke, Rev Dawit, Adanech and Fekadu for the love and care they have shown my family during the course of this study. Moreover, encouragements and best wishes from my father-in-law, Ayalew Adal, mothers-in-law, Alem Amare and Gete are highly appreciated.

Last but not least, I thank my Almighty God whose unfailing love has been behind every single step of making the completion of this study a reality.

ECONOMETRIC ANALYSIS OF THE WELFARE EFFECTS OF COMMON PROPERTY RIGHT FORESTRY PROGRAMS

by

Dambala Gelo Kutela

Promoter: Professor Steven F Koch

Department: Economics

Degree: PhD

Abstract

This thesis proposes to empirically evaluate fundamental welfare outcomes associated with common property rights forestry. The inferences made were based on data collected from selected villages in rural Ethiopia, where common property forestry programs are being run or are planned. The thesis comprises of three separate analysis chapters. The first of these analysis chapters engaged with the estimation of compensating variation, for community forestry intervention, using double-bounded contingent valuation methods while controlling for biases arising from anomalous preference revelation. The second analysis chapter aimed to identify salient community forestry program attributes that are preferred by potential program participants, estimate welfare effects and test preference heterogeneity for each of the selected attributes. The third analysis chapter aimed to estimate average treatment effects associated with the implementation of natural forest management decentralization, paying particular attention to identification issues.

The results from the first analysis chapter indicate that community forestry programs offer sizeable welfare benefits. Furthermore, double-bounded CVM studies in

developing country contexts also suffer from preference revelation anomalies, and, therefore, researchers should control for these anomalies. From the second analysis chapter, the welfare gain offered by community forestry was found to hinge largely on the proposed attributes of the program, such as the type of forest, area enclosure and type of land upon which the forest was to be situated. Moreover, the results pointed to significant differences in attribute preferences across the study population. In the third analysis chapter, after controlling for selection bias and treatment-effect heterogeneity associated with program participation, forest management decentralization programs were found to increase the average welfare of participant households between 19.96% and 33.63%. The results support the claim that common property right forestry management can be used to revive rural development and provide incentives for environmental protection, the latter of which has been uncovered in related research.<p>

Lead Promoter: Professor Steven F Koch

Co-leader: Professor James N Blignaut

External Examiners: Professor Randall Bluffstone, Portland State University, USA

Professor Anthony Leiman, University of Cape Town, SA

Table of content

Declaration.....	iii
Acknowledgement	iv
Abstract.....	ix
List of Tables.....	xi
List of Appendix.....	xii
Chapter 1 General Introduction.....	1
Chapter 2 Contingent Valuation of Community Forestry in Ethiopia: Should We Care About Preference Anomalies in Double-Bounded CVM?	15
Chapter 3 Does One Size Fit All? Heterogeneity in the Valuation of Community Forestry Programs	50
Chapter 4 The Welfare Effect of Common Property Forestry Rights: Evidence from Ethiopian Villages	85
Chapter 5 General Conclusion	118
Reference.	125

List of tables

Table2.1 Descriptive statistics of Bid Vectors used for Double-Bounded CVM	44
Table2.2 Descriptive Statistics of survey data	45
Table 2.3 Parameter estimates of simple probit model and bivariate model	46
Table2.4 Parameter estimates of random-effect probit models without covariates	47
Table 2.5 Parameter estimates of random-effect probit model with covariates	48
Table 2.6 Parameter estimates of random-effect IV-probit model with covariates	49
Table 3.1 Descriptive Statistics of Socio-economic Variables	80
Table 3.2 Utility Parameter Estimates from CL, RPL and LCM.....	81
Table 3.3 Average Marginal Willingness to Pay for Attributes	82
Table 3.4 Implied Direct Share Elasticities	83
Table 3.5 Correlation Matrix for Random Parameters from RPL	84
Table4.1. Descriptive statistics for baseline covariates and household welfare measures.....	118
Table 4.2. Propensity score estimates of the determinants of program participation...	119
Table 4.3 Matching Estimator Performance	115
Table 4.4 Treatment effect estimates under different estimation strategies	116
Table 4.5. Rosenbaum sensitivity analysis.....	122

List of appendix

Appendix 2.A. CVM questionnaire	140
Appendix 3.A Attributes and Levels Used in the Choice Experiment	145
Appendix 3. B Example Choice Set	146