

**COMPENSATION VALUATION FOR THE
RESETTLEMENT OF THE INDIGENOUS
COMMUNITIES IN BAKUN HYDROELECTRIC DAM,
SARAWAK, MALAYSIA**

LEE WEN CHIAT

**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
June 2014**

**COMPENSATION VALUATION FOR THE RESETTLEMENT OF THE
INDIGENOUS COMMUNITIES IN BAKUN HYDROELECTRIC DAM,
SARAWAK, MALAYSIA**

By

LEE WEN CHIAT

**Thesis submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
In Fullfillment of the Requirements for the Degree of Doctor of Philosophy**



Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

PERAKUAN KERJA TESIS / DISERTASI
(Certification of thesis / dissertation)

Kami, yang bertandatangan, memperakukan bahawa
(We, the undersigned, certify that)

LEE WEN CHIAT

calon untuk Ijazah **DOCTOR OF PHILOSOPHY**
(candidate for the degree of)

telah mengemukakan tesis / disertasi yang bertajuk:
(has presented his/her thesis / dissertation of the following title):

**COMPENSATION VALUATION FOR THE RESETTLEMENT OF THE INDIGENOUS COMMUNITIES
IN BAKUN HYDROELECTRIC DAM, SARAWAK, MALAYSIA**

seperti yang tercatat di muka surat tajuk dan kulit tesis / disertasi.
(as it appears on the title page and front cover of the thesis / dissertation).

Bahawa tesis/disertasi tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan, sebagaimana yang ditunjukkan oleh calon dalam ujian lisan yang diadakan pada:
11 Mei 2014.

(That the said thesis/dissertation is acceptable in form and content and displays a satisfactory knowledge of the field of study as demonstrated by the candidate through an oral examination held on:
11 May 2014).

Pengerusi Viva
(Chairman for Viva)

: **Prof. Dr. Mohd Zaini Abdul Karim**

Tandatangan
(Signature)

Pemeriksa Luar
(External Examiner)

: **Tan Sri. Prof. Datuk. Dr. Nik Mustapha R. Abdullah**

Tandatangan
(Signature)

Pemeriksa Luar
(External Examiner)

: **Dr. Lim Hock Eam**

Tandatangan
(Signature)

Tarikh: **11 May 2014**
(Date)

Nama Pelajar
(Name of Student) : **Lee Wen Chiat**

Tajuk Tesis / Disertasi
(Title of the Thesis / Dissertation) : **Compensation Valuation for The Resettlement of The Indigenous Communities in Bakun Hydroelectric Dam, Sarawak, Malaysia**

Program Pengajian
(Programme of Study) : **Doctor of Philosophy**

Nama Penyelia/Penyelia-penyelia
(Name of Supervisor/Supervisors) : **Assoc. Prof. Dr. Jamal bin Ali**



Tandatangan

Nama Penyelia/Penyelia-penyelia
(Name of Supervisor/Supervisors) : **Prof. Dr. K. Kuperan s/o K.V.S.N Viswanathan**



Tandatangan

PERMISSION TO USE

In presenting this thesis in fulfillment of the requirements for a Postgraduate Degree from Universiti Utara Malaysia (UUM), I agree that the library of the university, Perpustakaan Sultanah Bahiyah may make it freely available for inspection. I further agree that permission for copying this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisors or in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business. It is understood that any copying or publication or use of this thesis for financial gain shall not be allowed without my written permission. It is also understood that due recognition should be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any part of this thesis.

Request for permission to copy or make use of materials in this thesis, in whole or in part should be addressed to:

**Dean
Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman
Malaysia**

ABSTRACT

Compensation for indigenous communities as a result of development projects has been a controversial subject. The elements of rights, entitlements, freedom and justice are often difficult to value and left out in the compensation processes. Most of the compensation packages given to the indigenous communities are in-use values and non-use values are often ignored. The non-use values which include environmental, social and cultural values are very difficult to determine and often not compensated by government. These non-use values are more important compared with use values to the indigenous communities. In this study, a sample of 379 settlers in Sungai Asap Resettlement Scheme relocated as a result of the Bakun Hydroelectric Dam Project in Malaysia is surveyed to estimate the satisfaction with compensation as perceived by the settlers. The data was collected from September 2012 to December 2012. Logistic regressions models were used to identify the components of valuation of displacement cost that affect the settlers' satisfaction with compensation. The study of compensation valuation can result in better policies for compensating people affected by large projects. These policies will incorporate aspects of welfare more effectively thus increasing legitimacy for agencies involved in the relocation of communities. The findings showed that gaps in land compensation (differences in expected compensation and actual compensation paid out by state authorities) can result in dissatisfaction towards compensation. Besides that, environmental value (non-use value) perceived by the settlers is found to be significant in affecting probability of dissatisfaction towards compensation. The most important finding is that the lack of freedom and rights of settlers to participate in resettlement processes bring about dissatisfaction towards compensation. This has policy implication for government initiatives on compensation. An institutional avenue to consult and discuss the compensation figures with the settlers should be present to ensure agreeable compensation.

Keywords: compensation valuation, hydroelectric dam, use values, non-use values, freedom and rights

ABSTRAK

Pampasan yang diberikan kepada komuniti yang dipindahkan akibat daripada projek pembangunan menjadi isu yang kontroversi. Unsur-unsur kebebasan dan hak asasi adalah susah dinilai dan diketepikan semasa proses pampasan dilakukan. Kebanyakan pakej pampasan yang diberikan kepada komuniti orang asli adalah dalam nilai pasaran, manakala nilai bukan pasaran sering tidak diambil kira. Nilai bukan pasaran seperti nilai alam semulajadi, nilai soesial dan nilai budaya sering diketepikan semasa proses pampasan. Berbanding dengan nilai pasaran, nilai bukan pasaran ini adalah lebih penting kepada komuniti orang asli. Dalam kajian ini seramai 379 sampel komuniti yang terpaksa berpindah ke kawasan Perpindahan Sungai Asap disoal selidik untuk mengganggu tahap kepuasan terhadap pampasan yang dinilai oleh komuniti tersebut akibat daripada Projek Empangan Hidroelektrik Bakun di Malaysia. Data dikutip dari bulan September hingga Disember 2012. Model-model regresi logit telah digunakan untuk mengenalpasti komponen penilaian kos yang mempengaruhi kepuasan komuniti yang dipindahkan ke penempatan baru. Hasil kajian penting untuk polisi yang lebih baik bagi membayar pampasan yang lebih menyeluruh untuk meningkatkan kebajikan komuniti yang dipindahkan. Hasil kajian menunjukkan bahawa nilai jurang dalam pampasan tanah (hasil ditolak pampasan yang diharap oleh komuniti yang dipindahkan dan pampasan yang diberi oleh pihak berkuasa) boleh menyebabkan ketidakpuasan komuniti terhadap pampasan. Selain itu, kekurangan nilai alam semulajadi (nilai bukan pasaran) juga boleh menyebabkan ketidakpuasan komuniti terhadap pampasan. Sumbangan yang paling utama daripada hasil kajian mendapati bahawa tidak ada kebebasan dan hak asasi komuniti yang terlibat untuk memberikan pandangan dan suara semasa proses perpindahan dan pampasan menyebabkan ketidakpuasan komuniti terhadap pampasan. Hal ini memerlukan pihak berkuasa untuk merancang dan menyediakan institusi bagi membincangkan nilai pasaran dan nilai bukan pasaran dengan komuniti yang dipindahkan untuk mencapai persetujuan dalam pampasan.

Kata kunci: penilaian pampasan, empangan hidroelektrik, nilai pasaran, nilai bukan pasaran, kebebasan dan hak asasi

ACKNOWLEDGEMENTS

Finally after encountering many challenges, the PhD thesis of mine has been completed. I would like to thank a few persons who have contributed significantly on my journey towards the completion of my thesis.

First of all, I would like to thank my supervisors Prof. Dr. K. Kuperan Viswanathan and Associate Prof. Dr. Jamal Ali for guiding me throughout the research process. I have learnt a lot from them and am very fortunate to be under their supervision. They shaped and motivated me throughout the process of completing this PhD thesis.

In addition, I would also like to thank all the staff of the School of Economics, Finance and Banking for sharing their knowledge with me and for giving me important feedback for improving my thesis. I also would like to thank Associate Prof. Dr. Lim Hock Eam who has helped me a lot at the the data analysis stage.

Moreover, I would like to thank all the Sungai Asap sub-district officers, penghulu, head of villages and the settlers at Sungai Asap Resettlement Scheme for helping me in the data collection processes.

Last but not least, I would like to thank my beloved parents (Mr. Lee Cho Ming and Madam Sim Yian Peng) who have supported me during my PhD study. I also take this opportunity to thank my friends Miss Lo Xiu Rong, Mr. Foo Chuan Chew, Mr. Muhammad Baqir and many more in helping me to overcome difficulties during my PhD thesis. I really appreciate them from the bottom of my heart.

TABLE OF CONTENTS

	Page
TITLE PAGE	i
CERTIFICATION OF THESIS WORK	ii
PERMISSION TO USE	iv
ABSTRACT	v
ABSTRAK	vi
ACKNOWLEDGEMENTS	vii
LIST OF TABLES	xii
LIST OF FIGURES	xiv
ABBREVIATIONS	xv
LIST OF APPENDIXES	xvi
CHAPTER ONE	
INTRODUCTION	1
1.1 Background	1
1.2 Research Problem	9
1.3 Research Objectives.....	12
1.3.1 General Objective	12
1.3.2 Specific Objectives	12
1.4 Significance of the Study	13
1.5 Organization of the Thesis	15
CHAPTER TWO	
LITERATURE REVIEW	16
2.1 Introduction.....	16
2.2 Utility Theory.....	17
2.3 Classical Theory of Compensation	21
2.4 Modern Theories of Welfare and Valuation (Amartya Sen and John Rawls)	23
2.4.1 Freedom of Choice, Liberty and Welfare	24
2.4.2 Capabilities Approach.....	28
2.4.3 Legal Entitlement.....	29
2.4.4 Social Exclusion	30
2.4.5 Justice (John Rawl’s Theory of Justice)	31
2.4.6 Synthesis of the Theories of Compensation	32
2.5 Early Studies of Resettlement Impact.....	33
2.6 Theory of Risk and Reconstruction (Theory of Resettlement Impacts)	36
2.6.1 Landlessness	37
2.6.2 Joblessness	37
2.6.3 Homelessness.....	38
2.6.4 Marginalization	38
2.6.5 Food Insecurity	39
2.6.6 Increase in Morbidity and Mortality	39
2.6.7 Loss of Access to Common Property	40
2.6.8 Social Disarticulation.....	40
2.7 Theoretical Model of Valuation Methods	41
2.7.1 Theory of Revealed Preference.....	42

	Page
2.7.2 Two Methods of Revealed Preference.....	43
2.7.3 Theory of Expressed Preference.....	44
2.7.4 Theory of Contingent Valuation.....	44
2.7.5 Discrete Choice Experiment.....	47
2.7.6 Conclusion.....	48
2.8 Assessment of People’s Perception of Value on Displacement (Empirical Studies).....	49
2.8.1 Africa.....	49
2.8.2 Asia.....	51
2.9 Valuation in Other Sectors.....	59
2.9.1 Contingent Valuation Method.....	60
2.9.2 Discrete Choice Experiment Approach.....	63
2.9.3 Travel Cost Method.....	64
2.9.4 Hedonic Pricing Model.....	66
2.9.5 Synthesis of the Methods of Valuation.....	67
2.10 Valuation in Bakun Hydroelectric Dam.....	67
2.10.1 Problems in the Valuation of Use Values.....	69
2.10.1.1 Land Values.....	69
2.10.1.2 Compensation for Jungle Resources.....	72
2.10.1.3 Compensation for House Ownership.....	73
2.10.1.4 Non Participation of Indigenous Communities in Relocation Project... 74	74
2.10.2 Non-market Asset Loss /Non-use Value Loss (Social and Cultural Aspects).....	74
2.10.3 Synthesis of Valuation of Bakun.....	75
2.11 Conclusion.....	76
 CHAPTER THREE	
METHODOLOGY.....	78
3.1 Introduction.....	78
3.2 Theoretical Framework.....	78
3.3 Specification of Theoretical Model.....	80
3.3.1 Theory of Diminishing Marginal Utility (William Stanley Jevons).....	82
3.4 Empirical Model.....	83
3.4.1 Model 1: Satisfaction with Compensation (Logit Model).....	84
3.4.1.1 Logit regression model.....	84
3.4.1.2 Goodness of Fit Tests.....	88
3.4.1.3 Further Description on the Variables.....	89
3.4.2 Model 2: Compensation Gap (Ordered Logit Model).....	99
3.4.2.1 Ordered Logit Model for Compensation Gap.....	99
3.4.2.2 Goodness of Fit Tests.....	101
3.4.2.3 Further Description on the Variables.....	102
3.4.3 Model 3: Land Compensation Gap (Multinomial Logit Model).....	103
3.4.3.1 Regression Model for Land Compensation Gap.....	103
3.4.3.2 Goodness of Fit Tests.....	105
3.4.3.3 Further Description on the Variables.....	105
3.5 Data Collection Strategies and Survey Instruments.....	106
3.5.1 Study Area.....	106

	Page
3.5.2 Data Collection Strategies	110
3.6 Sampling Technique	111
3.7 Pre-testing Questionnaires	112
3.8 Survey Instrument.....	112
3.9 Measurement of the Variables	114
3.10 Data Analysis.....	115
3.10.1 Descriptive Analysis.....	116
3.11 Regression Analysis.....	116
3.12 Chapter Summary	117
CHAPTER FOUR	
DESCRIPTIVE ANALYSIS OF DATA	118
4.1 Introduction.....	118
4.2 Descriptive Statistics of Continuous/ Discrete Variables	118
4.3 Descriptive Statistics of Dummy/Categorical Variables	121
4.4 Levels of Satisfaction with Regard to Continuous Variables	125
4.5 Level of Satisfaction with Regard to Categorical/Dummy Variables	128
CHAPTER FIVE	
REGRESSION RESULTS	132
5.1 Introduction.....	132
5.2 Regression Analysis.....	132
5.2.1 Model 1: Satisfaction with Compensation.....	132
5.2.1.1 Regression of Model 1 with Gap Variables as Independent Variables .	133
5.2.1.2 Regression of Model 1 with Use Value Variables as Independent Variables	136
5.2.1.3 Regression of Model 1 with Non-use Value Variables as Independent Variables	140
5.2.1.4 Regression of Model 1 with Socio-demographic Variables as Independent Variables	142
5.2.1.5 Regression of Model 1 with Freedom and Right Variables as Independent Variables	146
5.2.2 Summary of Regression Results in Model 1: Satisfaction Level Towards Compensation	150
5.3 Model 2: Compensation Gap.....	152
5.4 Model 3: Land Compensation Gap.....	162
5.5 The Monetary Values of Gaps in Compensation.....	176
5.6 Summary.....	178
CHAPTER SIX	
DISCUSSION AND POLICY IMPLICATIONS.....	180
6.1 Introduction.....	180
6.2 General Compensation Policy in Bakun Project.....	180
6.3 Implications of Findings for Policies	181
6.3.1 Land (Difference in Expected Compensation and Actual Compensation)....	181

	Page
6.3.2 Environment.....	184
6.3.3 Freedom and Rights	185
6.4 Valuation Procedures in Malaysia	186
6.5 Involvement of Multiple Agencies	187
 CHAPTER SEVEN	
CONCLUSION	188
 7.1 Introduction.....	188
7.2 Summary of Significant Variables in Model 1, 2 and 3	188
7.3 Limitations of the Study.....	189
7.4 Future Research	190
 REFERENCES.....	192

LIST OF TABLES

Table	Page
Table 1.1: Population Census of the Affected Communities in Year 1998.....	4
Table 1.2: Total Population by Ethnic Group and Household, Sub-district and State, Malaysia in Year 2010	5
Table 3.1: Ethnic Composition at Sungai Asap 2001	108
Table 3.2: The Population Composition at Sungai Asap in 1998.....	109
Table 3.3: Total Population by Ethnic Group and Household, Sub-district and State, Malaysia 2010.....	110
Table 4.1: Descriptive Statistics for Continuous Variables	119
Table 4.2: Descriptive Statistics for Gap Variables	120
Table 4.3: Descriptive Statistics for Freedom and Rights Variables	121
Table 4.4: Descriptive Statistics for Gender and Marital Status.....	122
Table 4.5: Descriptive Statistics for Employment Status and Jobs	122
Table 4.6: Descriptive Statistics for Education Status.....	123
Table 4.7: Descriptive Statistics for Ethnic Groups.....	123
Table 4.8: Descriptive Statistics for Religious Groups.....	124
Table 4.9: Descriptive Statistics for Use Values	124
Table 4.10: Descriptive Statistics for Non-use Values	125
Table 4.11: Profiling for Vontinuous Variables	126
Table 4.12: Profiling for Freedom and Rights Variables.....	127
Table 4.13: Profiling for Gender, Marital Status and Religious Groups	128
Table 4.14: Profiling for Education Level	129
Table 4.15: Profiling for Ethnic Groups	129
Table 4.16: Profiling for Employment Status	130
Table 4.17: Profiling for Social Values and Cultural Values	130
Table 5.1: Model Summary of Model 1 with Gap Variables as Independent Variables.....	133
Table 5.2: Multicollinearity: Vif of Model 1 with Gap Variables as Independent Variables.....	133
Table 5.3: Coefficient of Robust Test in Model 1 with Gap Variables as Independent Variables.....	135
Table 5.4: Model Summary of Model 1: Satisfaction with Compensation; Use Value Variables	137
Table 5.5: Multicollinearity: Vif of Model 1: Satisfaction with Compensation; Use Value Variables	137
Table 5.6: Coefficient of Robust Test in Model 1 with Use Value Variables as Independent Variables	139
Table 5.7: Model Summary of Model 1 with Non-use Value Variables as Independent Variables	140
Table 5.8: Multicollinearity: Vif of Model 1 with Non-use Value Variables as Independent Variables	141
Table 5.9: Coefficient of Robust Test in Model 1 with Non-use Value Variables as Independent Variables	141
Table 5.10: Model Summary of Model 1 with Socio-demographic Variables as Independent Variables	142

Table	Page
Table 5.11: Multicollinearity: Vif of Model 1 with Socio-demographic Variables as Independent Variables.....	142
Table 5.12: Coefficient of Robust Test in Model 1 with Socio-demographic Variables as Independent Variables	145
Table 5.13: Model Summary of Model 1 with Freedom and Rights Variables as Independent Variables.....	147
Table 5.14: Multicollinearity: Vif of Model 1 with Freedom and Rights Variables as Independent Variables.....	147
Table 5.15: Coefficient of Robust Test in Model 1 with Freedom and Rights Variables as Independent Variables	149
Table 5.16: Summary of Regression Results in Model 1 and Profiling Results.....	152
Table 5.17: Summary of Model 2: Compensation Gap	154
Table 5.18: Multicollinearity: Vif of Model 2: Compensation Gap	154
Table 5.19: OLS, Ordered Logit and Multinomial Logit Estimation of Compensation Gap	156
Table 5.20: OLS Estimation of Land Compensation Gap	163
Table 5.21: Multinomial Logit Estimation of Land Compensation Gap	166
Table 5.22: Marginal Effect of Land Compensation Gap.....	170
Table 5.23: Odds Ratio Multinomial Logit Estimation of Land Compensation Gap	172
Table 5.24: Ringgit Values of Cash Gaps for 14 Villages at Sungai Asap Resettlement Area	177
Table 6.1: Comparisons of Land Compensation Policies Among Countries	183

LIST OF FIGURES

Figure	Page
Figure 1.1: Location Map of Sungai Asap Resettlement Area	2
Figure 2.1: Indifference Curve.....	18
Figure 2.2: Kaldor-Hicks Welfare Criterion.....	22
Figure 2.3: Valuation Methods for Measuring Use Values and Non-use Values.....	42
Figure 3.1: Conceptual Model for the Use Values and Non-use Values to Arrive at a Compensation Value.....	79
Figure 5.1: P-P Plot to Show the Normal Distribution After Compensation Gap is Recategorized	153
Figure 5.2: Histogram of Land Compensation Gap After Recategorization	165

ABBREVIATIONS

WCD	World Commission on Dams
VIF	Variance Inflation Factor
MNL	Multinomial Logit Model
OLS	Ordinary Least Square
WTP	Willingness to Pay
WTA	Willingness to Accept

LIST OF APPENDIXES

Appendix	Page
APPENDIX 1: Survey Instrument	203
APPENDIX 2: Definition and Measurement of Variables	211
APPENDIX 3: Model 1: Satisfaction with Compensation; Gap Variables	215
APPENDIX 4: Model 1: Satisfaction Level; Use Value Variables	219
APPENDIX 5: Model 1: Satisfaction with Compensation; Non-use Value Variables.....	222
APPENDIX 6: Model 1: Satisfaction with Compensation; Socio-demographic Variables.....	226
APPENDIX 7: Model 1: Satisfaction Level; Freedom and Rights Variables	230
APPENDIX 8: Model 2: Compensation Gap: OLS and Goodness of Fit Test	235
APPENDIX 9: Model 2: Compensation Gap: Ordered Logit	238
APPENDIX 10: Model 3: Land Compensation Gap: OLS regression, Specification Error and Normality Test.....	241
APPENDIX 11: Model 3: Land Compensation Gap: Ordered Logit Regression	243
APPENDIX 12: Model 3: Land Compensation Gap: Multinomial Logit Regression.....	244

CHAPTER ONE

INTRODUCTION

1.1 Background

Bakun hydroelectric dam project has raised much controversy among the local residents and non-governmental organization when it was first proposed in early 1980. The worries are whether the Bakun hydroelectric dam project can improve the welfare of the people of Sarawak and contribute to the development of Malaysia. The resettlement issue is of particular importance to the indigenous communities as they will experience changes in their welfare once the Bakun hydroelectric dam project is implemented.

The idea to build the Bakun hydroelectric dam was mooted by the then Prime Minister of Malaysia, Dato Seri Dr. Mahathir Mohamad with the objective to exploit the hydroelectric potential of the Sarawak river in order to supply cost-effective and clean hydroelectricity to Peninsular Malaysia and Sarawak and bring development to the indigenous people through more industrial development and employment. The Bakun project is part of "Electricity Master Plan for Sarawak" undertaken by Sarawak Electricity Supply Company (SESCO).

The Bakun hydroelectric dam is very important to Sarawak's economy and the Malaysian economy as a whole as it can generate 2400MW of power capacity. This can increase the economic growth of Sarawak and Malaysia. It is believed that Bakun hydroelectric dam project can also bring benefits such as irrigation and recreation and tourism. Malaysia faced power supply problems in the 1980's. The national grid then

The contents of
the thesis is for
internal user
only

REFERENCES

- Agba, A.M.O., Akpanudoedehe, J.J. & Ushie, E.M. (2010). Socio-Economic and Cultural Impacts of Resettlement on Bakassi People of Cross River State, Nigeria. *Studies in Sociology of Science*, 1(2), 50-62.
- Afroz, R. & Masud, M.M. (2011). Using a contingent valuation approach for improved solid waste management facility: Evidence from Kuala Lumpur, Malaysia. *Waste Management*, 31, 800-808.
- Arrow, K.J., Solow, R., Portney, P.R., Lerner, E.E., Radner, R. & Schuman, H. (1993). 'Report of the National Oceanic and Atmospheric Administration (NOAA) Panel on Contingent Valuation'. *Federal Register*, 58(10), 4016-614.
- Asafu-Adjaye, J. & Tapsuwan, S. (2008). A contingent valuation study of scuba diving benefits: Case study in Mu Ko Similan Marine National Park, Thailand. *Tourism Management*, 29, 1122-1130.
- Banji, C. (2011, January 16). RM100m for Belaga: Prime Minister announces eight mammoth projects which will directly benefit some 28000 villagers. *The Sunday Post*, p.6.
- Banji, C. (2011, October 23). Subtle criticisms through poetry. *The Borneo Post*, p.1.
- Beck, U. (1992). *Risk Society: Toward a New Modernity*. London: Sage.
- Blanchflower, G.D. & Oswald, J.A. 2004. Well-being over time in Britain and USA. *Journal of Public Economics*, 88:1359-1386.
- Bohlen, C. & Lewis, L.Y. (2009). Examining the economic impacts of hydropower dams on property values using GIS. *Journal of Environmental Management*, 90(3), 258-269.
- Borghesi, J. & Jan, S. (2008). Measuring the benefits of health promotion programmes: Application of contingent valuation method. *Health policy*, 87 (2), 235-248.

- Brenchin, S. R., West, P., Harmon, D. & Kutay, K.(1991). "Resident Peoples and Restricted Areas: A Framework for Inquiry." In West and Brenchin (eds.) *Resident Peoples and National Parks*, Arizona, Tucson: University of Arizona Press.
- Campbell, D. T. & Stanley, J. (1966). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.
- Cao Thi, T.Y. (2003). *Towards Sustainability of Vietnam's large Dams – Resettlement in Hydropower Projects, Stockholm*. Retrieved December 20, 2011 from <http://www.infra.kth.se/bba/MASTER%20THESISSES/msc%20thesis%20cao.pdf>
- Cernea, M. M. (1990). *Poverty Risks from Population Displacement In Water Resources Development*, HIID Development Discussion Paper No. 355, Harvard University, Cambridge, MA.
- Cernea, M. M. (1991). *Putting People First: Sociological Variables in Development Projects*, 2nd edition. New York: Oxford University Press.
- Cernea, M. M. (1995). Understanding and Preventing Impoverishment from Displacement: Reflections on the State of Knowledge. Keynote Address, International Conference on Development Induced Displacement. University of Oxford, England. *Journal of Refugee Studies*. 8:3:245-264.
- Cernea, M.M. (1995). Understanding and preventing impoverishment from displacement: Reflections on the state of knowledge. *Journal of Refugee Studies*, 8(3), 245-264.
- Cernea, M. M. (1996). "Bridging the Research Divide: Studying Refugees and Development Oustees." In Tim Allen (ed.) *In Search of Cool Ground: War, Flight & Homecoming in Northeast Africa*, Boston: UNRISD.

- Cernea, M. M. (1997). The risks and reconstruction model for resettling displaced populations. *World Development*, 25 (10), 1569-1587.
- Cernea, M. M. (1998). "Impoverishment or Social Justice?" A Model for Planning Resettlement." In H.M. Mathur and D. Marsden, (eds.) *Development Projects and Impoverishment Risks: Resettling Project-Affected People in India*, Delhi: Oxford U.P.
- Cernea, M. M. (1999). "The Need for Economic Analysis of Resettlement: A Sociologist's View." In Michael M. Cernea (ed.) *The Economics of Involuntary Resettlement: Questions and Challenges*, Washington, DC: The World Bank.
- Cernea, M. (2003). *For a new economics of resettlement: A sociological critique of the compensation principle*. Washington, DC: World Bank.
- Chambers, R. (1969). *Settlement Schemes in Tropical Africa*. Routledge & Kegan Paul, London.
- Cummings, R. G., Brookshire, D. S. & Schulze, W. D. (1986). *Valuing Environmental Goods: A State of the Arts Assessment of the Contingent Method*. Totowa, NJ: Rowman and Allanheld.
- Deaton, A. & Muellbauer, J. (1980). *Economics and Consumer Behaviour*. Cambridge: Cambridge University Press.
- Department of Statistics, Malaysia (2010). *Population Distribution by Local Authority Areas and Mukims*. Kuala Lumpur: Department of Statistics, Malaysia.
- De Vaus, D. (2002). *Analyzing social science data*. Sage Publication.
- De Wet, C. (1995). *Moving Together, Drifting Apart*. Johannesburg: Witwatersrand U.P.

- Dwivedi, R. (1999). 'Displacement, Risks and Resistance: Local Perceptions and Actions in the Sardar Sarovar'. *Development and Change*, 30(1):43-78.
- Eliason, S. R. (1993). *Maximum likelihood estimation logic and practice*. Sage Publication Inc.
- Elster, J. & Roemer, J.E. (1991). Introduction. In Jon Elster and John E. Roemer, editors, *Interpersonal Comparison of Wellbeing*, pages 1-16. Cambridge University University Press, Cambridge, 1991.
- Gabungan (1999). The Resettlement of Indigenous People affected by the Bakun Hydroelectric Project, Sarawak, Malaysia. *World Commission on Dams Final Report*. Cape Town: World Commission on Dams.
- Garrod, G. & Willis, K. G. (1999). *Economic Valuation of the Environment: Methods and Case Studies*. UK: Edward Elgar.
- Gregory, R. & Bishop, R.C. (1986). "Willingness to Pay or Compensation Demanded." Paper presented at the Workshop on Integrating Psychology and Economics in Valuing Public Amenity Resources, Estes Park, Colo., May.
- Gregory, R. (1986). "Interpreting Measures of Economic Loss: Evidence from Contingent Valuation and Experimental Studies." *Journal of Environmental Economics and Management*, 13, 325-337.
- Gujarati, D. N. & Porter, D.C. (2009). *Basic econometrics*. New York: McGraw-Hill.
- Hanley, N. & Splash, C. L. (1993). *Cost-Benefit Analysis and the Environment*. UK: Edward Elgar, Hunts.
- Harrell, F.E.(2001). *Regression modeling strategies with applications to linear models, logistic regression, and survival analysis*. New York: Springer.
- Henderson, J. M. & Quandt, R. E. (1980). *Microeconomic theory: A mathematical approach*. Singapore, SG: McGraw-Hill International Editions.

- Herbild, L., Bech, M. & Gyrd-Hansen, D. (2009). Estimating the Danish Populations' Preferences for Pharmacogenetic Testing Using a Discrete Choice Experiment. The Case of Treating Depression. *Value in Health*, 12(4), 560-567.
- Hicks, J.R.(1939). "The Foundations of Welfare Economics."*Economic Journal*, 49, 696-712.
- Hoehn, J. P. & Randall, A. (1983). "*Incentives and Performance in Contingent Policy Valuation.*" Paper presented at the American Agricultural Economics Association summer meetings, Logan, Utah.
- Hoehn, J. P. & Randall, A. (1985). "*A Satisfactory Benefit Cost Indicator from Contingent Valuation.*" Staff Paper 85-4, Department of Agricultural Economics, Michigan State University.
- Hoehn, J. P. & Randall, A. (1987). "A Satisfactory Benefit Cost Indicator from Contingent Valuation." *Journal of Environmental Economics and Management*, 14 (3), 226-247.
- Hooker, M.B. (1999). A note on native land tenure in Sarawak (Research Notes), *Borneo Research Bulletin*. Retrieved March 13, 2012, from <http://www.highbeam.com>.
- Howley, P., Hynes, S. & O'Donoghue, C. (2010). The citizen versus consumer distinction: An exploration of individuals' preferences in contingent valuation studies. *Ecological Economics*, 69(7), 1524-1531.
- Hwang, S-S., Cao, Y. & Xi, J. (2010).The Short-Term Impact of Involuntary Migration in China's Three Gorges: A Prospective Study. *Social Indicator Research*, 101(1), 73-92.
- Jehom, W. J. (2008). *Development and displacement: Kenyah-Badeng in Bakun Resettlement Malaysia*. Bonn, Germany: Universität zu Bonn; 2008.

- Just, R. E., Hueth, D. L. & Schmitz, A. (1982). *Applied Welfare Economics and Public Policy*. Englewood Cliffs, N.J.: Prentice Hall.
- Kaldor, N. (1939). "Welfare Propositions in Economics and Interpersonal Comparisons of Utility," *Economic Journal*, 49, 549-552.
- Kahnemann, D. & Tversky, A. (1979). "Prospect Theory: An Analysis of Decision under Risk." *Econometrica*, 263-291.
- Karimi, S. & Taifur, W. D. (2013). Resettlement and development: a survey of two of Indonesia's Koto Panjang resettlement villages. *International Journal of Water Resources Development*, 29(1), 35-49.
- Lancaster, K.J. (1998). *Consumer Theory*. Northampton, M.A: Edward Elgar Publishing.
- Leach, W. A. (1975). *Disturbance on compulsory purchase*. London: The Estates Gazette.
- Lin, N. Y., Ye, X. & Ensel, W. M. (1999). Social support and depressed mood: A structural analysis. *Journal of Health and Social Behavior*, 40, 344-359.
- Ling, J. (2011, August 8). Bakun an eco-tourism goldmine. People in Sungai Asap resettlement area must work with SEB to tap its potential-Masing. *The Borneo Post*, p.1.
- Local District Office, Sungai Asap (2001). *The population composition at Sungai Asap in 2001* obtained from Development and displacement: Kenyah-Badeng in Bakun Resettlement Malaysia, Welyne Jeffrey Jehom Doctoral Dissertation (2008), 1-145.
- Long, J.S. (1997). *Regression Models for Categorical and Limited Dependent Variables*. SAGE Publications, Thousand Oaks, California.

- Mahalia, B. (1994) Letter from a tribal village. *Lokayan Bulletin*, 11.2(3): 157–158.
Sept.–Dec 1994.
- Manatunge, J. & Takesada, N. (2013). Long-term perceptions of project affected-
persons: a case study of the Kotmale Dam in Sri Lanka. *International Journal of
Water Resources Development*, 29(1), 87-100.
- Mason, R. D. & Lind, D. A. (1990). *Statistical Techniques in Business and
Economics*. (Ninth Edition). USA: Irwin.
- Matsumoto, K., Mizuno, Y. & Onagi, E. (2013). The long-term implications of
compensation schemes for community rehabilitation: the Kusaki and Sameura
dam projects in Japan. *International Journal of Water Resources Development*,
29(1), 109-119.
- McIntosh, E. & Ryan, M. (2002). Using discrete choice experiments to derive
welfare estimates for the provision of elective surgery: Implications of
discontinuous preferences. *Journal of Economic Psychology*, 23 (3), 367-382.
- Menard, S. (1995). *Applied logistic regression analysis*. Sage University papers
series.
- Mitchell, R. & Carson, R. (1989). *Using Surveys to Value Public Goods: The
Contingent Valuation Method*. Washington, DC: Resources for the Future.
- Nelson, M. (1973). *Development of Tropical Lands: Policy Issues in Latin America*.
Baltimore: Johns Hopkins U.P.
- Ojeda, M., Mayer, A. & Solomon, B. (2008). Economic valuation of environmental
services sustained by water flows in the Yaqui River Delta. *Journal of Ecological
Economics*, 65: 155-166.

- Olawepo, R. A. & Lawal, M. O. (2010). Post Resettlement Pattern of Socio-economic Change and Rural Development in Jebba Villages, Nigeria. *Journal of Sustainable Development in Africa*, 12(6), 162-176.
- Rani, H.O. (2004). *Economic and Business Research For Malaysian Students*. Tanjong Malim, Malaysia: Universiti Pendidikan Sultan Idris (UPSI).
- Rawls, J. (1971). *A Theory of Justice*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Rolfe, J. & Prayaga, P. (2007). Estimating values for recreational fishing at freshwater dams in Queensland. *The Australian Journal of Agriculture and Resource Economics*, 51, 157-174.
- Rosseau, J. (1994). Review of socio-economic studies and preliminary recommendations for the resettlement of the Kayan and Lahanan of the Upper Balui. (Kuching: Report Submitted to the State Planning Unit, Jabatan Ketua Menteri, Sarawak, September 27).
- Rowan-Robinson, J. & Brand, C.M. (1995). *Compulsory purchase and compensation*. London: Sweet & Maxwell.
- Russell, R. R. & Wilkinson, M. (1979). *Microeconomics: A synthesis of modern and neoclassical theory*. New York, NY: John Wiley & Sons, Inc.
- Sarkar, P. K. (1998). *Law of land acquisition of land in India*. Delhi: Eastern Law House.
- Scudder, T. & Colson, E. (1982). "From Welfare To Development: A Conceptual Framework for the Analysis of Dislocated People." In Hansen A. and A. Oliver-Smith (eds.) *Involuntary Migration and Resettlement*. CO, Boulder: Westview Press.

- Samuelson, P. (1938). A Note on the Pure Theory of Consumers' Behaviour. *Economica*, 5, 61-71.
- Sekaran, U. & Bougie, R. (2009). *Research Methods for Business: A Skill Building Approach*. United Kingdom: John Wiley & Sons Ltd.
- Sen, A. (2000). The Discipline of Cost and Benefit Analysis. *The Journal of Legal Studies*, 29(2), 931-952.
- Sen, A. (1988). Freedom of choice: Concept and content. *European Economic Review*, 32, 269-294.
- Sen, A. (1999). *Development as Freedom*. New York, NY: Anchor Books, A Division of Random House.
- Sen, A. (2000). *Social exclusion: Concept, application and scrutiny*. Social Development Papers No. 1, Office of Environmental and Social Development, Asian Development Bank, June 2000.
- Sen, A. (2003). Development as Capability Expansion. In Sakiko Fukuda-Parr and A.K.Shiva Kumar, editors, *Readings in Human Development, Concepts, Measures and Policies for a Development Paradigm*, p. 3-16. Oxford University Press.
- Shavell, S.(1993). Contingent Valuation Of The Nonuse Value Of Natural Resource: Implications For Public Policy and The Liability System, in Jerry A. Hausman (ed.) *Contingent Valuation: A Critical Assessment (Contributions to Economic Analysis, Volume 220)*, Emerald Group Publishing Limited, p.371-388.
- Shuib, A. (2011). *Value of Outdoor Recreation*. FEB Working Paper Series, No. 1102, University Malaysia Sarawak (UNIMAS), Malaysia.
- Sibon, P. (2011, August 2). Bakun set to go commercial this Saturday. *The Borneo Post*, p. 5.

- Souksavath, B. & Nakayama, M. (2013). Reconstruction of the livelihood of resettlers from the Nam Theun 2 hydropower projects in Laos. *International Journal of Water Resources Development*, 29(1), 71-86.
- Sovacool, B. K. & Valentine, S. V. (2011). Bending bamboo: Restructuring rural electrification in Sarawak, Malaysia. *Energy for Sustainable Development*, 15, 240-253.
- Sunardi, Gunawan, B., Manatunge, J. & Pratiwi, F. D. (2013). Livelihood status of resettlers affected by the Saguling Dam project, 25 years after inundation. *International Journal of Water Resources Development*, 29(1), 25-34.
- Swain, A & Chee, A.M. (2004). Political Structure and Dam Conflicts: Comparing Cases in Southeast Asia. In: World Water Council, editor. *Proceedings of the Workshop on Water and Politics: Understanding the Role of Politics in Water Management*. Paris, France: World Water Council.
- Swainson, L. & McGregor, A. (2008). Compensating for development: Orang Asli experiences of Malaysia's Sungai Selangor dam. *Asia Pacific Viewpoint*, 49(2), 155-167.
- Thompson, H. & Hui, S. (2001). *Bakun Dam Lurches Forward*. World Rivers Review. June.
- Tyler, T. R. (1990). *Why People Obey the Law*. Princeton and Oxford: Princeton University Press.
- Warnock, M. (2003). *Utilitarianism and on Liberty*. Malden, MA: Blackwell.
- WCD (2000). *Dams and development : A new framework for decision-making* (The report of the world commission on dams, 2000 edition). Retrieved December 26, 2011 from www.unep.org/dams/WCD/report/WCD_DAMS%20report.pdf

Xi, J. & Hwang, S-S (2011). Unmet expectations and symptoms of depression among Three Gorges Project resettlers. *Social Science Research*, 40 (1), 245-256.

Yoshida, H., Agnes, R. D., Solle, M. & Jayadi, M. (2013). A long-term evaluation of families affected by the Bili-Bili Dam development resettlement project in South Sulawesi, Indonesia. *International Journal of Water Resources Development*, 29(1), 50-58.