



**UNIVERSITI PUTRA MALAYSIA**

***ECONOMIC IMPACT OF CLIMATE CHANGE  
ON MALAYSIAN RUBBER PRODUCTION***

**PARTHAJYOTI BORKOTOKY**

**FP 2012 38**

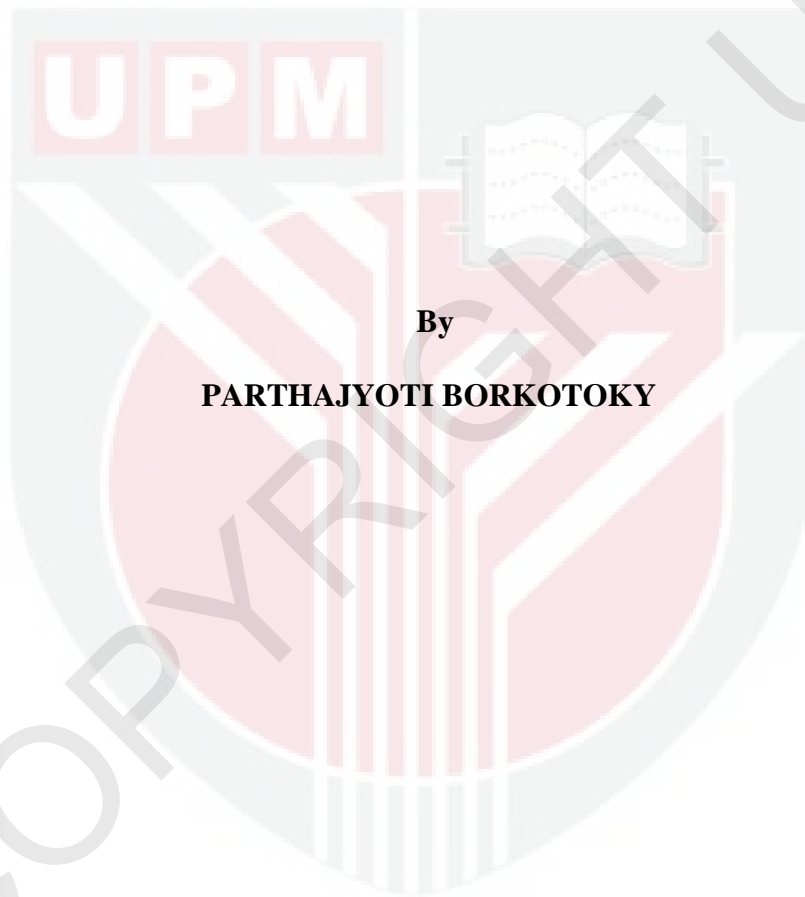
**ECONOMIC IMPACT OF CLIMATE CHANGE ON  
MALAYSIAN RUBBER PRODUCTION**



**PARTHAJYOTI BORKOTOKY**

**Master of Science  
Universiti Putra Malaysia  
2011**

**ECONOMIC IMPACT OF CLIMATE CHANGE ON MALAYSIAN  
RUBBER PRODUCTION**



**By**

**PARTHAJYOTI BORKOTOKY**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in  
Fulfilment of the Requirement of the Degree of Master of Science**

**February 2012**

Abstract of the thesis presented to the senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Masters of Science

**ECONOMIC IMPACT OF CLIMATE CHANGE ON MALAYSIAN RUBBER PRODUCTION**

**By**

**PARTHAJYOTI BORKOTOKY**

**February 2012**

**Chairperson: Ismail Abd Latif, PhD**

**Faculty: Agriculture**

The incidence and intensity of extreme weather will be more frequent, which will likely challenge human and natural systems more than normal change. Agricultural sector falls under the primary damage sector due to climate change and is considered one of the most vulnerable sector to climate change. Climate has been changing in the conventional rubber growing regions of the country and the current temperature is at the higher end of the optimal temperature range for rubber crop. Thus further increases will adversely affected growth and productivity of natural rubber.

The main objective of this study is to estimate the economic impact of climate change on natural rubber in Peninsular Malaysia and to capture the marginal impact of weather conditions on the viability of production systems along with the future climate change impact by predicting the economic impact due to the expected climate change.

The present study uses and extends the Ricardian Model to estimate the climate change impacts on Malaysian rubber production using time series data from 1980-2010. Impacts were estimated by changes in net revenue of rubber for estates and smallholders and combination of both with change in climate. The future impact of change in temperature that is increase in temperature was found to have nonlinear effects on natural rubber production. The results of this study also highlight the importance of precipitation for natural rubber. Marginal impacts of the precipitation and temperature indicate direct and negative relationship between rubber net revenue. The results were in line to what was expected.

Furthermore marginal increase of temperature and precipitating will results in a loss of about RM 208 million in total. Based on future climate change scenarios from Atmosphere/Ocean General Circulation Model (AOGCMs) the rubber industry will bear a loss between RM 239/Ha to RM 805/Ha if no action is taken and in broader scale it losses between RM 246 million to RM 829 million in total.

Abstract of the thesis presented to the senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master Sains

**IMPAK EKONOMIK PERUBAHAN IKLIM TERHADAP  
PENGELUARAN GETAH MALAYSIA**

Oleh

**PARTHAJYOTI BORKOTOKY**

**Februari 2012**

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**Fakulti: Pertanian**

Kejadian dan kekerapan cuaca buruk yang sudah menjadi kebiasaan akan mencabar sistem ekologi manusia dan semulajadi yang sedia ada. Sektor pertanian adalah yang paling mudah mengalami kerosakan yang disebabkan oleh perubahan cuaca. Cuaca telah berubah dalam kawasan pengeluaran getah utama di Malaysia dan ini akan mempengaruhi pertumbuhan dan produktiviti sektor getah asli. Objektif utama kajian ialah untuk menganggar impak perubahan cuaca terhadap sektor ekonomi getah asli di Semenanjung Malaysia. Kajian juga akan perubahan mendapatkan impak marginal perubahan cuaca terhadap viabiliti sistem pengeluaran dan mengunjur impak ekonomi yang disebabkan oleh keadaan tersebut.

Kajian ini menggunakan Model Ricardian untuk menganggar impak perubahan cuaca terhadap pengeluaran getah Malaysia dengan menggunakan data cuaca dari 1980 – 2010 di lima lokasi di Semenanjung Malaysia. Kesan impak dianggarkan melalui perubahan hasil bersih getah untuk pekebun kecil, estet dan kombinasi kedua sistem tersebut dengan perubahan cuaca.

Keputusan menunjukkan kesan impak perubahan suhu di masa hadapan yang tidak linear terhadap pengeluaran getah. Kajian juga menunjukkan kepentingan hujan dalam sektor getah asli. Impak marginal hujan bertalian secara terus manakala suhu bertalian secara negatif dengan hasil pulangan getah. Keputusan kajian ini adalah seperti yang dijangkakan.

Peningkatan marginal angkubah suhu dan hujan akan menyebabkan kerugian sejumlah RM 208 juta. Berdasarkan scenario perubahan cuaca masa hadapan dari *ATMOSPHERE/OCEAN GENERAL CIRCULATION MODEL*, industri getah akan mengalami kerugian di antara RM 239/ha hingga RM 805/ha jika tiada tindakan mitigasi diambil. Seterusnya ini akan menyebabkan jumlah kerugian terkumpul sejumlah RM 246 juta hingga RM 829 juta untuk tujuh puluh tahun dari 2025 sehingga tahun 2095.

## ACKNOWLEDGEMENTS

The successful completion of this study has come through the support and help that came from many people whom mentioning each one may not be exhaustive. I wish to express my sincere gratitude to all people who put forward their kind help and gratitude throughout my Masters period.

I express my heartfelt thanks and gratitude to Dr. Ismail Abd Latif for his overwhelming guidance; support and encouragement that made me accomplish this uphill task. Working with him helped me learn new things and improve upon my own research and writing skills. It was from him, I have learnt what is good research and quality work. I really appreciate his critical and thorough insights while reviewing my work. I would also send my heartfelt thanks to the members of supervisory committee, Dr. Zainal Abidin Mohamed and Dr. Abdullahi Farah Ahmed for their support and guidance throughout my master's research and, which helped me to complete it on time.

Furthermore, thanks to Dr. Amin Mahir Abdullah for his valuable comments and suggestions. Special thanks to Dr. Law for helping me in running the model and without whose help the model simulation would not have been possible.

I would like to thank to all the lecturers and staff in the Department of Agribusiness and Information Systems for their guidance and support during the study.



My special thanks to Radin who helped me a lot during my data collection, I will be always indebted to him. Thanks to all my friends and colleagues for their continuous support.

I am deeply indebted to my parents, especially for my Mother since her love, care; affections and support have helped me in achieving this level. I am always thankful to my father who through his prayers did not allow any obstacles to come in my way to see that I successfully complete my thesis. I am thankful to my brother and sister-in-law for their moral support and encouragement during my entire master's period.

Finally, my regards and thanks to all those of you who have supported and encouraged me on to reach this level or the ones during my entire masters program.

This thesis was submitted to the senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of **Master of Science**.  
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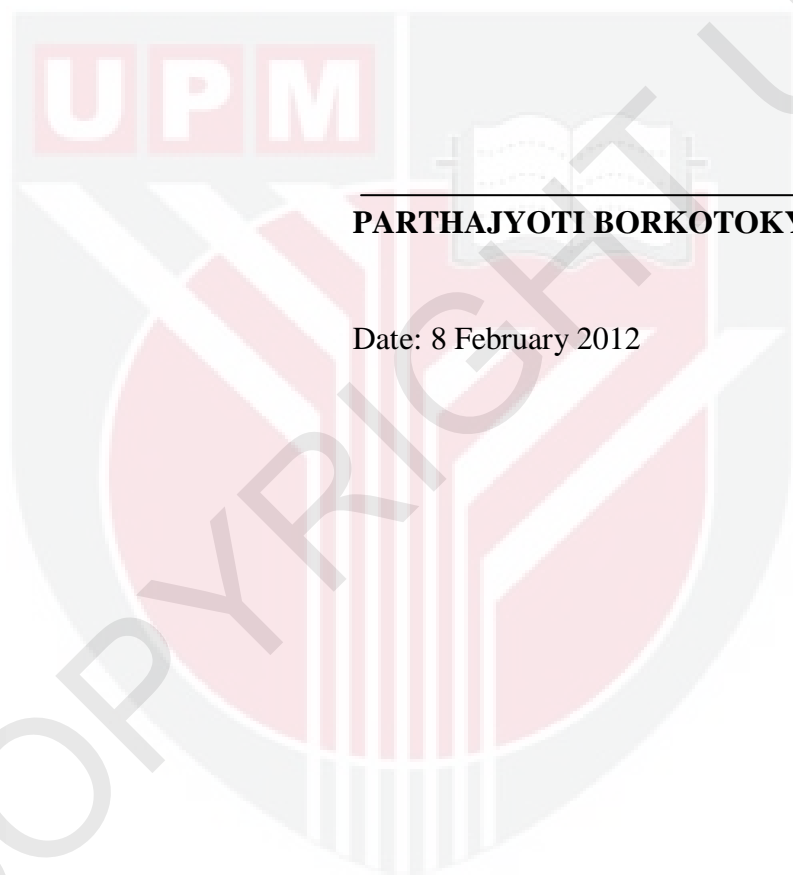
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Date:

## DECLARATION

I declare that this thesis is my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Putra Malaysia or other Institution.



**PARTHAJYOTI BORKOTOKY**

Date: 8 February 2012

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