



UNIVERSITI PUTRA MALAYSIA

**ASSESSING THE TECHNICAL EFFICIENCY OF
MALAYSIAN COCOA PRODUCTION**

HARNIE HARUN

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**MASTER OF SCIENCE
UNIVERSITI PUTRA MALAYSIA**

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**ASSESSING THE TECHNICAL EFFICIENCY OF
MALAYSIAN COCOA PRODUCTION**

By

HARNIE HARUN

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

June 2011

Especially dedicated to my dearly beloved:

Husband,

Ibrahim Sjah bin Hj. Padu

Children,

Muhammad Anas Hilmi Syah

Muhammad Akmal Syah

Muhammad Asyraaf Syah

Muhammad Umar Haziq Syah

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June 2011

Chairman: Professor Mad Nasir Shamsudin, PhD

Faculty: Agriculture

The growth of the cocoa upstream industry is considered relatively slow, largely because of the continuous decline in the cocoa output. The rate of decline in the cocoa output was 74.2% on the average between 2000 and 2009, thus requiring serious measures that should be undertaken to safeguard the cocoa production sector. Malaysia's cocoa production structure, which is currently comprised largely of smallholders, faced with a challenge on improving the productivity to increase the production. Due to this, the key of addressing the challenges of increasing the cocoa production in Malaysia is to focus on the efficiency in the cocoa smallholding sector. This study is conducted to determine the efficiency of cocoa production in Malaysia and to analyze the contributing factors to the efficiencies, particularly among the cocoa smallholders. This study will also serve as a guideline for the industry in recommending strategies to be adopted to improve the smallholdings sector.

The Stochastic Frontier production approach was used to measure the level of efficiency in this study due to its consistency with theory, relative ease of estimation as well as versatility. The empirical model employed in this study is the Cobb-Douglas as a frontier production function. It was found to be suitable in representing the sampled data and gave better estimates of technical efficiency than the Translog model.

The results indicated that variance caused by variables of technical inefficiency is larger than the variance caused by the uncontrolled factors related to the production process. The average computed technical efficiencies for Peninsular Malaysia was 0.47, while in Sabah was 0.44 and Sarawak, 0.20. The large efficiency differentials among these cocoa smallholders were an indication of a substantial potential for efficiency improvement in the cocoa production in the three regions. The economic implication of the study reveals that efficiency among the cocoa smallholders in Peninsular Malaysia could be increased by 53%, followed by Sabah (56%) and Sarawak (80%).

From the findings, it can be concluded that there exist a high level of technical inefficiency of about 63 percent, which implies that input utilization is far below the optimum level. There is also a need to introduce a higher-level of technology, planning and training to improve resource allocation as well as adopting the technology of best-practiced farm. The extension services, which are currently implemented should be enhanced and improved as these services is a significant role in improving technical efficiency in the cocoa production in Malaysia. Increasing efficiency of the cocoa production may encouraged the increase in capital investment hence influence more people to invest in the cocoa planting as well as stimulate growth of cocoa production in Malaysia.

MENILAI KECEKAPAN PENGELUARAN KOKO DI MALAYSIA

Oleh

HARNIE HARUN

Jun 2011

Pengerusi: Profesor Mad Nasir Shamsudin, PhD

Fakulti: Pertanian

Industri pengeluaran koko di Malaysia kini berhadapan dengan cabaran untuk memulihkan produktiviti tanaman berikutan dari kejatuhan berterusan tingkat pengeluaran, iaitu pada kadar purata pengurangan sebanyak 74.2% di antara tahun 2000 hingga 2009. Sehubungan dengan itu, cabaran utama dalam menyelesaikan isu-isu berhubung dengan produktiviti tanaman koko adalah dengan memberi tumpuan kepada kecekapan dalam penggunaan sumber-sumber bagi meningkatkan pengeluaran koko negara. Memandangkan kecekapan adalah faktor utama dalam menentukan pertumbuhan dalam pengeluaran, penyelidikan ini bertujuan untuk mengkaji isu-isu mengenai kecekapan teknikal dalam pengeluaran koko di Malaysia serta faktor-faktor yang mempengaruhi kecekapan, terutamanya di kalangan pekebun kecil koko di Malaysia. Hasil dari kajian ini juga akan menjadi landasan bagi merangka dasar dan strategi pembangunan sektor pekebun kecil serta aktiviti-aktiviti penyelidikan dan pembangunan, pemindahan teknologi dan sokongan teknikal.

Penyelidikan ini menggunakan pendekatan pengeluaran *Stochastic Frontier* untuk mengukur tahap kecekapan memandangkan penganggaran menggunakan pendekatan tersebut adalah lebih mudah dan konsisten. Model empirikal yang digunakan untuk mengkaji isu-isu berkaitan kecekapan teknikal dalam pengeluaran koko di Malaysia adalah model *Stochastic Cobb-Douglas*. Ini adalah berikutan dari kesesuaian model tersebut untuk mewakili data dalam sampel kajian disamping memberi penganggaran yang lebih baik berbanding model *translog*.

Penemuan dari penyelidikan ini juga menunjukkan perbezaan yang disebabkan oleh faktor-faktor ketidakcekapan dalam pengeluaran adalah lebih besar daripada perbezaan yang disebabkan oleh faktor-faktor yang wujud di luar kawalan proses pengeluaran. Kecekapan teknikal yang diperolehi di Semenanjung Malaysia menunjukkan nilai purata sebanyak 0.47, manakala di Sabah sebanyak 0.44 dan Sarawak sebanyak 0.20. Implikasi ekonomi dari penyelidikan tersebut menunjukkan wujudnya jurang perbezaan kecekapan yang besar di ketiga-tiga wilayah Semenanjung Malaysia, Sabah dan Sarawak dan potensi untuk memperbaiki kecekapan dalam pengeluaran koko di wilayah-wilayah tersebut adalah masing-masing sebanyak 53 peratus, 56 peratus dan 80 peratus.

Penemuan dari penyelidikan juga menunjukkan bahawa secara purata, ketidakcekapan dalam pengeluaran di Malaysia dianggarkan pada kadar 63 peratus. Ini menunjukkan bahawa pekebun-pekebun kecil perlu diberi pendedahan dari segi kepentingan dan penggunaan input yang optimum, teknologi dan inovasi terkini, latihan bagi memperbaiki pengagihan dan peruntukan sumber yang lebih cekap serta mengapakai teknologi pekebun kecil koko yang terlatih dan berpengalaman sebagai

faktor pendorong menyumbang kepada peningkatan dalam produktiviti tanaman. Aktiviti-aktiviti pemindahan teknologi yang dilaksanakan perlu diperbaiki serta diperkukuhkan memandangkan aktiviti tersebut memainkan peranan yang penting dalam meningkatkan kecekapan pengeluaran koko di Malaysia. Peningkatan kecekapan dalam pengeluaran koko bukan sahaja menyumbang kepada peningkatan kepada pelaburan modal, malah menggalakkan lebih ramai pengusaha untuk melabur dalam penanaman koko seterusnya merangsang pertumbuhan industri koko di Malaysia.



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I certify that a Thesis Examination Committee has met on 16 June 2011 to conduct the final examination of Harnie binti Harun on her thesis entitled “Assessing the Technical Efficiency of Malaysian Cocoa Production” in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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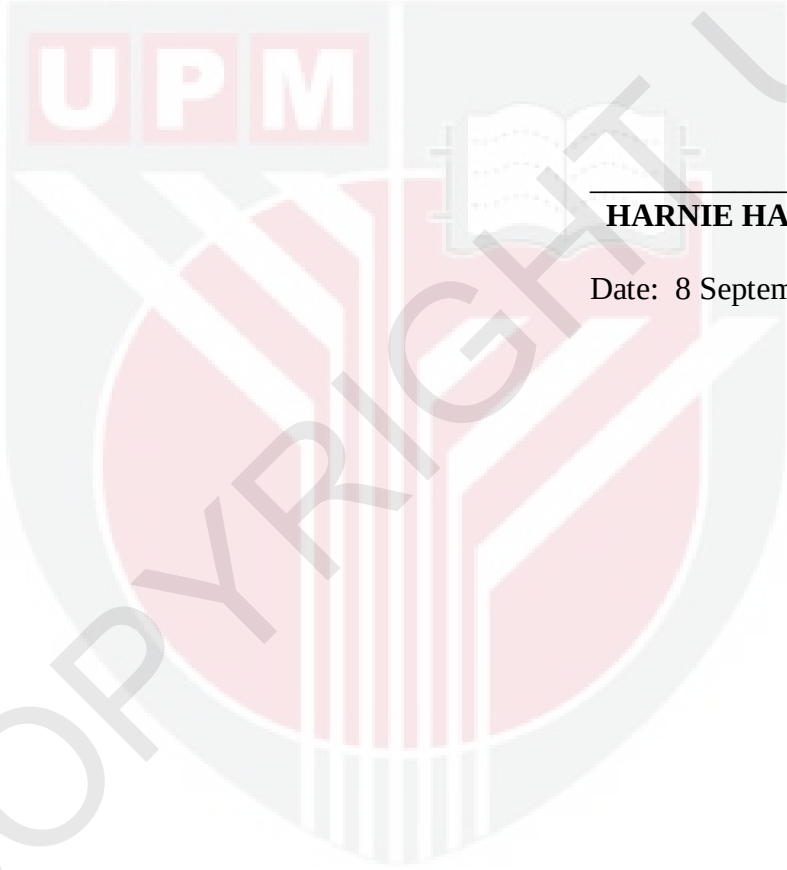
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Date: 8 September 2011

DECLARATION

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



HARNIE HARUN

Date: 8 September 2011

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