



UNIVERSITI PUTRA MALAYSIA

**EFFICIENCY PERFORMANCE OF MALAYSIAN BRACKISH
WATER WHITE SHRIMP PRODUCTION**

LIM GHEE THEAN

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**DOCTOR OF PHILOSOPHY
UNIVERSITI PUTRA MALAYSIA**

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**EFFICIENCY PERFORMANCE OF MALAYSIAN BRACKISH WATER
WHITE SHRIMP PRODUCTION**

By

LIM GHEE THEAN

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

July 2014

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DEDICATION

Specially dedicated to my beloved

Grandma,

Tang Siew Gan (1926 – 2008)

Wife,

Lee Huay Lin

Parents,

Lim Ah Seng & Ng Gook Hiang

Daughter,

Lim Shu-Na

Lim Xin-Er

Brothers,

Lim Ghee Sern & Lim Ghee Geen

Uncles, Aunties, Cousins

And

Friends

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Doctor of Philosophy

**EFFICIENCY PERFORMANCE OF MALAYSIAN BRACKISH WATER
WHITE SHRIMP PRODUCTION**

By

LIM GHEE THEAN

July 2014

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Institute : Institute of Agricultural and Food Policy Studies

Shrimp aquaculture industry is playing a vital role in Malaysia agricultural economy, especially its increasing contribution to balance of trade of agricultural products. Brackish water white shrimp production is the main contributor of Malaysian shrimp aquaculture industry. However, Malaysian brackish water white shrimp production is facing low productivity performance and issue of environmental degradation that caused by shrimp culturing. Hence, this study attempts to measure technical, allocative and cost efficiency, and production risk of Malaysian brackish water white shrimp production. Parametric (stochastic frontier analysis) and non parametric approaches (data envelopment analysis) are applied in this study. In this study, dependent variables are production of white shrimp and cost of production; while independent variables are quantity of inputs (labour, feed and seed) and price of inputs (labour, feed and seed). In addition, the factors such as full-time, farmer's age, education level, experience, seminar, land ownership, pond size, number of ponds, pond age, fertilization, size of fry and culturing days are applied in technical inefficiency and cost inefficiency analyses. Average scores of technical, allocative and cost efficiency that generated by parametric approach are 54.7%, 66.3% and 36.4%, respectively. While average scores of technical, allocative and cost efficiency that generated by non parametric approach are 43.3%, 59.9% and 26.1%, respectively. Besides, result of production risk analysis indicated that labour is considered as a risk decreasing input, but feed and seed are considered as risk increasing inputs. Results of parametric and non parametric approaches consistently showed that factor of seminar negatively and significantly affect technical inefficiency and cost inefficiency. Hence, government authority should organize more seminars that related to shrimp aquaculture, management, accounting and motivation for the shrimp farmers. Besides, government authority should implement mandatory attendance at seminar for the shrimp farmers. Efficiency performance of Malaysian brackish water white shrimp production needs to be improved in order to achieve higher productivity, at the same time minimize the environmental degradation.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

PRESTASI KECEKAPAN PENGELUARAN UDANG PUTIH AIR PAYAU DI MALAYSIA

Oleh

LIM GHEE THEAN

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Industri akuakultur udang memainkan peranan penting dalam ekonomi pertanian Malaysia, terutamanya sumbangan yang semakin meningkat dalamimbangan perdagangan produk pertanian. Pengeluaran udang putih air payau merupakan penyumbang utama kepada industri akuakultur udang Malaysia. Walau bagaimanapun, pengeluaran udang putih air payau Malaysia telah menghadapi masalah-masalah seperti produktiviti yang rendah dan isu pencemaran alam sekitar yang disebabkan penternakan udang. Oleh sedemikian, kajian ini bertujuan untuk mengukur kecekapan teknikal, kecekapan peruntukan input, kecekapan kos, dan risiko pengeluaran dari pengeluaran udang putih air payau Malaysia. Pendekatan parametrik (stochastic frontier analysis) dan bukan parametrik (data envelopment analisis) telah digunakan dalam kajian ini. Dalam kajian ini, variabel dependen ialah pengeluaran udang putih dan kos pengeluaran; manakala variabel bebas merupakan kuantiti input (buruh, makanan dan benih) dan harga input (buruh, makanan dan benih). Tambahan pula, faktor-faktor seperti sepenuh masa, umur petani, taraf pendidikan, pengalaman, seminar, pemilikan tanah, saiz kolam, bilangan kolam, umur kolam, pembajaan, saiz benih dan hari pembelaan telah diaplikasikan dalam menganalisis ketidakcekapan teknikal dan ketidakcekapan kos. Skor purata kecekapan teknikal, kecekapan peruntukan input dan kecekapan kos yang dihasilkan oleh analisis pendekatan parametrik ialah 54.7%, 66.3% dan 36.4% masing-masing. Sebaliknya, skor purata kecekapan teknikal, kecekapan peruntukan input dan kecekapan kos yang dihasilkan oleh pendekatan bukan parametrik ialah 43.3%, 59.9% dan 26.1% masing-masing. Selain itu, keputusan analisis risiko pengeluaran menunjukkan bahawa buruh adalah dianggap sebagai input yang dapat mengurangkan risiko pengeluaran, tetapi makanan dan biji benih adalah dianggap sebagai input yang dapat meningkatkan risiko pengeluaran. Keputusan-keputusan pendekatan parametrik dan bukan parametric sama-sama menunjukkan bahawa seminar didapati mempengaruhi secara negatif terhadap ketidakcekapan teknikal dan ketidakcekapan kos dengan ketaranya. Oleh itu, pihak berkuasa kerajaan haruslah menganjurkan lebih banyak seminar yang berkaitan dengan akuakultur udang, pengurusan, perakaunan dan motivasi untuk penternak-penternak udang. Di samping itu, pihak berkuasa kerajaan juga haruslah mewajibkan penternak-penternak udang untuk menghadiri seminar yang dianjurkan. Prestasi kecekapan pengeluaran udang putih air payau di Malaysia perlu dipertingkatkan supaya dapat mencapai produktiviti yang lebih tinggi sambil mengurangkan pencemaran alam sekitar.

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APPROVAL

I certify that a Thesis Examination Committee has met on **14th July 2014** to conduct the final examination of Lim Ghee Thean on his thesis entitled “**Efficiency Performance Of Malaysian Brackish Water White Shrimp Production**” in accordance with the Universities and University Colleges 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 Doctor of Philosophy.

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