



**UNIVERSITI PUTRA MALAYSIA**

***IKNOWLEDGE, ATTITUDE, AND PRACTICES OF  
SWIFTLET RANCHERS IN SUSTAINABLE  
SWIFTLET RANCHING IN JOHOR, MALAYSIA***

**SELVAKKUMAR S/O K. N. VAIAPPURI**

**FP 2013 63**



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**MASTER OF SCIENCE  
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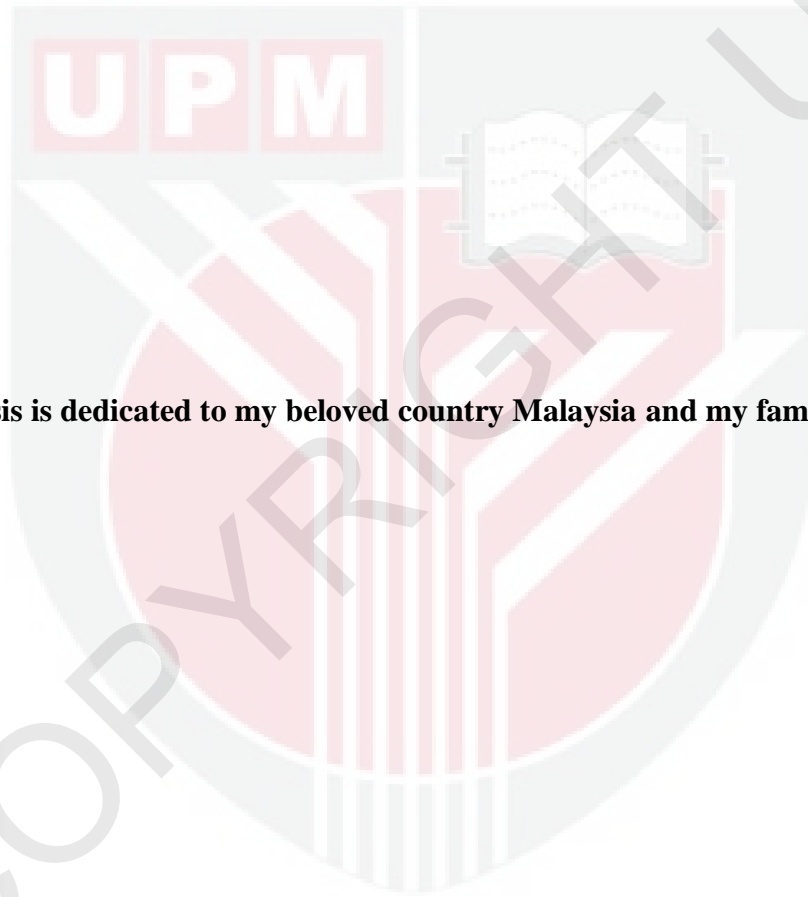
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Fulfilment of the Requirements for the Degree of Master of Science.**

**September 2013**

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**This thesis is dedicated to my beloved country Malaysia and my family members.**

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Abstract of this thesis presented to the senate of Universiti Putra Malaysia in fulfilment  
of the requirements for the degree of Master of Science

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**SELVAKKUMAR S/O K.N. VAIAPPURI**

**September 2013**

**Chairman : Nitty Hirawaty Kamarulzaman, PhD**

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The swiftlet ranching is an activity that conducted in bird house that imitate cave-like environment in order to provide alternative nesting sites to lure the swiftlet birds with remain natural living style (behaviour). The swiftlet ranching activities mainly rely on the nature and environment. Thus, the environment factor is the main concern in the swiftlet industry as to keep the industry for a long term. Uncontrolled development of swiftlet houses can cause a sustainable risk to the industry. One of the main issues is regarding environmental disturbance for public surrounding the bird house. Swiftlet ranchers commonly use 'bird calling sound' to attract the birds and build their nests in the bird house. The ranchers will keep on playing the sounds from morning until evening to attract more birds to come to their bird house..

The specific objectives of this study are to investigate the knowledge, attitude and practices (KAP) levels of swiftlet ranchers towards sustainable swiftlet ranching; to determine the relationship between knowledge, attitude, and practices levels of swiftlet ranchers; to examine the relationship between knowledge, attitude and practices levels and swiftlet ranchers socio-demographic profiles; determine factors that influence sustainable swiftlet ranching which affect the ranchers' knowledge, attitude, and practices levels of swiftlet ranchers towards sustainable swiftlet ranching and to determine the effectiveness of EBN production and socio-demographic profiles on swiftlet ranchers' KAP levels.

A total of 136 ranchers were selected from Johor and face-to-face interviews were conducted to collect data using a structured questionnaire. The result showed that 71.3% ranchers have an adequate knowledge level. The knowledge level was determined based on overall score. Among the ranchers, 66.7% ranchers showed they have a favourable attitude towards sustainable swiftlet ranching. The result also indicated that 61.76% ranchers had high level of sustainable practices in their ranching activities.

The Pearson correlation result showed that the knowledge level and attitude were positively related with scores of 0.768 and 0.827 for knowledge level and sustainable practices respectively. The relationship between attitude and practices was positively related with score of 0.932. The Pearson correlation was significant at 1% level of significance. Meanwhile, based on the results from factor analysis, three main factors

were revealed to influence sustainable swiftlet ranching namely economic, social, and environment.

Multiple liner regression using factor scores from the factor analysis was employed to indentify the most influential factor for sustainable practices among the respondents. The result revealed the respondents' practices level and economy, social and environment factors have positive relationships. Further, logistic regression was employed in this study to measure the effect of EBN production and socio-demographic factors on respondents' KAP levels. The study found that the socio-demographic variables such as age, level of education, attend course, EBN production, and years of experience have significant relationship between swiftlet respondents' KAP levels.

An improvement in the government policy is urgently required. Since the results of this study clearly showed that education and attending seminars on swiftlet ranching revealed to have significant effects on respondent's KAP levels, more related programmes, seminars and workshops should be conducted by government agencies. The existing policy which is mainly focused on EBN production includes less focus or attention to sustainable issues in the swiftlet ranching. Sustainable practices are a grass root to ensure the survival of swiftlet industry for long term. The extensions agencies must keep working with respondents and others parties in order to improve and strengthen the swiftlet industry in Malaysia.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai  
memenuhi keperluan Ijazah Master Sains

**PENGETAHUAN, SIKAP DAN AMALAN PENGUSAHA BURUNG WALIT  
DALAM KAEDAH PENGUSAHAAN BURUNG WALIT SECARA LESTARI DI  
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Oleh

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Pengusahaan burung walit adalah aktiviti yang dijalankan di dalam rumah burung walit yang serupa dengan persekitaran gua yang menjadi tapak alternatif untuk burung walit bersarang. Pengusahaan burung walit ini mengekalkan gaya hidupan semula jadi (tingkah laku), dimana burung sentiasa bebas untuk melakukan aktiviti mereka sendiri seperti pergerakan, pembiakan atau pemakanan (mencari serangga) tanpa apa-apa gangguan oleh pengusaha. Aktiviti pengusahaan burung walit amat bergantung kepada alam sekitar. Maka, faktor persekitaran merupakan faktor utama bagi kelestarian industri burung walit untuk jangka masa yang panjang. Pembangunan rumah burung walit yang tidak terkawal boleh menyebabkan kesejahteraan industri tersebut terjejas. Salah satu isu utama adalah mengenai gangguan persekitaran kepada penduduk di sekitar rumah burung walit. Pengusaha burung walit biasanya menggunakan 'bunyi memanggil burung' untuk menarik burung walit masuk ke dalam rumah dan membina sarangnya di

dalam rumah tersebut. Pengusaha akan terus memainkan bunyi panggilan tersebut dari pagi hingga petang untuk menarik lebih banyak burung untuk datang ke rumah burung mereka. Sebahagian daripada pengusaha menukar lot kedai menjadi rumah burung walit, yang terletak berhampiran dengan kawasan perumahan. Ini akan mewujudkan beberapa gangguan dan pencemaran bunyi kepada penduduk setempat.

Objektif spesifik kajian ini adalah untuk mengenal pasti tahap pengetahuan, sikap dan amalan terhadap pengusahaan burung walit secara lestari; untuk menilai hubungan antara pengetahuan, sikap dan amalan pengusahaan burung walit secara lestari, untuk mengkaji hubungan antara pengetahuan, sikap dan amalan pengusahaan burung walit secara lestari dan sosio-demografi pengusaha burung walit, dan untuk menentukan faktor-faktor yang mempengaruhi pengusahaan burung walit secara lestari yang memberi kesan kepada pengetahuan, sikap dan amalan pengusaha, ke arah amalan pengusahaan yang lestari dan untuk menentukan keberkesanan pengeluaran sarang dan profil sosio-demografi terhadap tahap pengetahuan, sikap dan amalan pengusaha burung walit.

Seramai 136 responden telah dipilih dari seluruh Johor dan temuduga bersemuka telah dijalankan untuk mengumpul data dengan menggunakan soal selidik berstruktur. Hasil kajian menunjukkan bahawa 71.3% responden berpengetahuan tentang pengusahaan burung walit secara lestari. Tahap pengetahuan telah ditentukan berdasarkan markah keseluruhan. Seramai 66.7% responden juga menunjukkan sikap yang baik ke arah pengusahaan burung walit secara lestari. Hasil kajian ini juga menunjukkan bahawa

61.76% responden mempunyai tahap amalan mampan dalam aktiviti pengusahaan mereka.

Keputusan korelasi Pearson menunjukkan bahawa hubungan antara tahap pengetahuan dengan sikap pengusaha mempunyai hubungan yang positif dengan nilai pekali korelasi 0.768 dan 0.827 bagi tahap pengetahuan dan amalan responden yang lestari. Bagi hubungan antara sikap dan amalan responden yang lestari adalah menunjukkan hubungan yang positif dengan nilai pekali korelasi 0.932. Sementara itu, berdasarkan keputusan daripada analisis faktor, tiga faktor utama telah dikenalpasti mempengaruhi pengusahaan burung walit secara lestari seperti ekonomi, sosial dan persekitaran.

Analisis regresi linear berganda menggunakan skor daripada analisis faktor telah digunakan untuk mengenalpasti faktor yang paling berpengaruh bagi amalan lestari di kalangan pengusaha. Hasil kajian menunjukkan bahawa tahap amalan pengusaha dan faktor-faktor seperti ekonomi, sosial, dan persekitaran mempunyai hubungan yang positif dan signifikan. Analisis regresi logistik telah digunakan dalam kajian ini untuk mengukur kesan pengeluaran sarang burung walit dan faktor-faktor sosio-demografi terhadap tahap pengetahuan, sikap dan amalan pengusaha burung walit.

Kajian ini mendapati bahawa faktor-faktor seperti umur, tahap pendidikan, menghadiri kursus, pengeluaran sarang burung walit dan tahun pengalaman mempunyai kesan positif terhadap tahap pengetahuan, sikap dan amalan pengusaha burung walit. Berdasarkan penemuan ini, peranan agensi-agensi kerajaan dan swasta perlu dilanjutkan

untuk membangunkan tahap pengetahuan, sikap dan amalan pengusaha burung walit bagi meningkatkan kelestarian industri burung walit. Dengan dasar dan idea yang unggul akan dapat memastikan kelestarian industri burung walit untuk jangka masa panjang. Dalam erti kata lain, kelestarian industri burung walit di Malaysia seterusnya akan dapat ditingkatkan.



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Finally, I pray that I shall be a good steward of this honour.



I certify that a Thesis Examination Committee has met on 27 September 2013 to conduct the final examination of Selvakkumar s/o K.N. Vaiappuri on his thesis entitled “Knowledge, Attitude, and Practices of Swiftlet Ranchers in Sustainable Swiftlet Ranching in Johor, Malaysia” 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 Master of Science.

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## DECLARATION

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I hereby confirm that:

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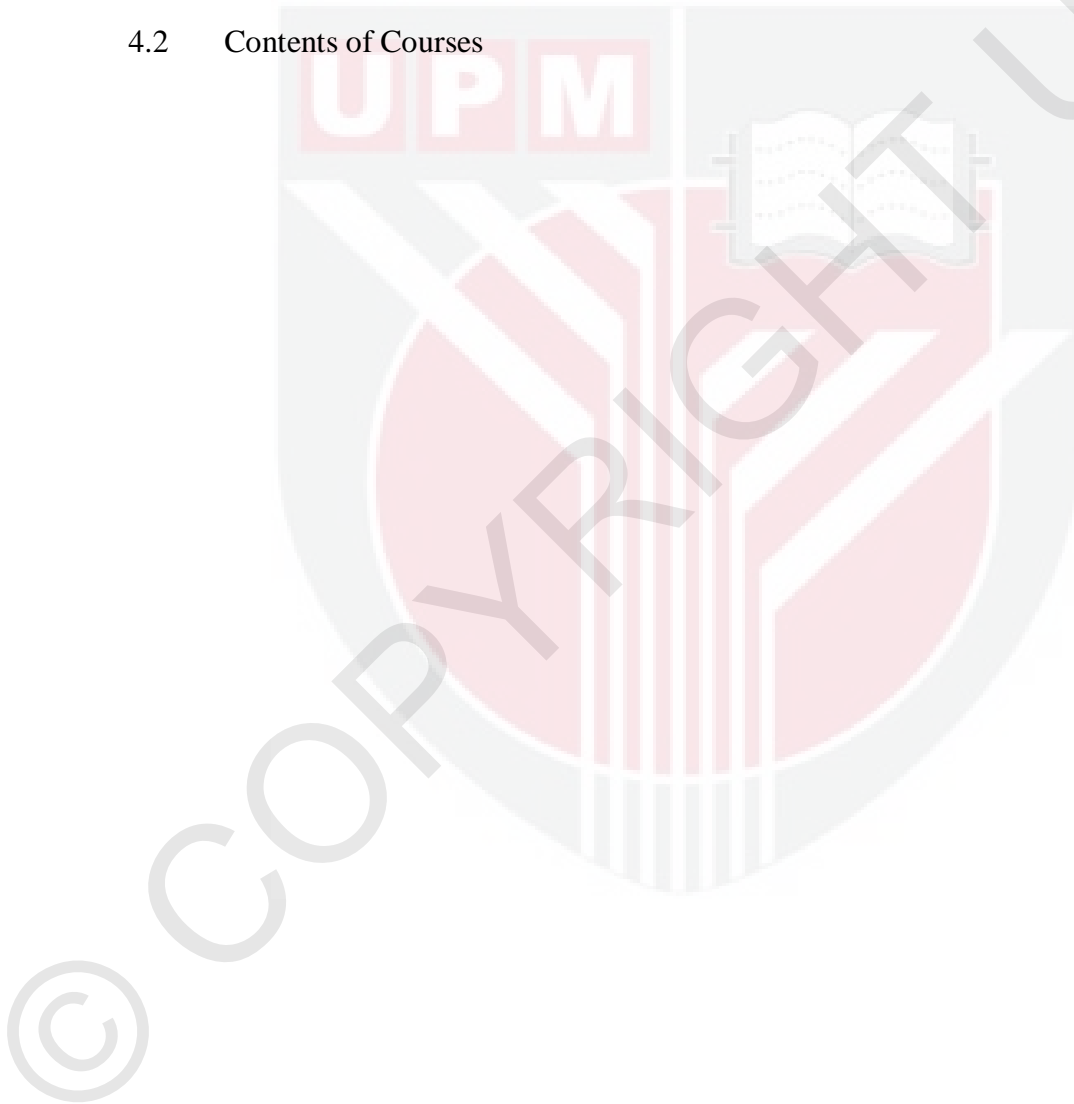
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## LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
DOA	Department of Agriculture
DOSM	Department of Statistics, Malaysia
DVS	Department of Veterinary Services
EBN	Edible Bird Nest
EFA	Exploratory Factor Analysis
EPP	Entry Point Project
EPU	Economic Planning Unit
ETP	Economic Transformation Programme
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
KAP	Knowledge, Attitude and Practices
KM	Kilometre
KMO	Kaiser-Meyer-Olkin
MFR	Malaysian Food Regulations
NGO	Non-Governmental Organizations
NKEA	National Key Economic Area
PBC	Perceived Behavioural Control
PCA	Principal Component Analysis
PPM	Parts Per Million
R&D	Research and Development

SD	Standard Deviation
SAPNs	Sustainable Agricultural Practice Needs
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for the Social Science
SSA	Sub-Saharan Africa
TCM	Traditional Chinese Medicine
TPB	Theory of Planned Behaviour
TRA	Theory of Reason Action
USD	United States Dollar
UNSD	United Nations Division for Sustainable Development
VIF	Variance Inflation Factor



## **CHAPTER ONE**

### **INTRODUCTION**

The discussion in this chapter covers introduction on swiftlet industry, problem statement, research questions and objectives of the study. An introduction about swiftlet industry and its contribution to the nation is discussed in the introduction section. The problem occurred in the swiftlet industry is explained in the problem statement. The research questions become a guideline for developing the objectives of this study. The significance of the study is discussed to express the impact of the study to all respective parties.

#### **1.1 Agriculture in Malaysia**

According to the Department of Statistics, Malaysia (DOSM) (2010), Malaysia is a multiracial country with a total population of 27.6 million people and average household size is 4.31 people. It is a tropical and one of the suitable countries for agriculture activities due to its proximity to the equator (Basiron, 2007). Agriculture is an important sector in Malaysia. The agriculture sector contributes significant benefits to the nation in terms of economic, social and politic (Adger, 2000; Barlow, 2012). In 2010 the agriculture sector had contributed to nation Gross Domestic Product (GDP) value about RM40,484 million which was about 7.2% and the total export value for the agricultural products was RM106,864 million (16.7 %) (DOSM, 2010).

Agriculture is important to the rise of civilizations development when cultivation, animal husbandry and food surplus led to the next allows development in an emergent number of population and classes among community (Bauer, 2011). Agriculture enabled people to produce surplus food. They could use this extra food when crops failed or trade it for other goods. Food surpluses allowed people to work at other tasks unrelated to farming (National Geographic Education, 2013). Agriculture sector, between economic activities is categorized as primary sector as well as from mining and quarrying. Despite the rapidly increasing urbanization and a lot of focus given to manufacturing and services, majority Southeast Asian populations still inhabit rural areas and depend on agriculture as the main economic resource (Maclean, Dawe, & Hettel, 2002).

Development economists in general, and agricultural economists in particular, have long focused on how agriculture can best contribute to overall economic growth and modernization, premised on their in-grained believe that robust agricultural growth and productivity increases are crucial to sustain economic development, at least up till the middle of 1980s (Mukhlis& Sallehuddin, 2008;Wong, 2007). The agriculture sector continued to contribute to the overall development of the economy and remained resilient despite the economic slowdown. The development thrust of the sector was to improve the levels of productivity, competitiveness and dynamism, and hence incomes, through greater commercial orientation and the wider adoption of new technologies and modern management systems (Economic Planning Unit (EPU), 2012; Wong, 2007).

The agriculture development programmes were aimed at expanding production of food commodities to improve the food trade balance, increasing export of industrial commodities and ensuring a sustainable supply of raw materials to support the growth of domestic agro-based industries (Wong, 2007). Agriculture segment in Malaysia can be categorized by the co-existence plantation and smallholder's subsectors. It could later classify into food and industrial commodities. The food sub sectors may include paddy, vegetables, fruits, meats and fish while main industrial commodities are palm oil, rubber and cocoa.

Agriculture's noteworthy involvement towards Malaysia's economic expansion may clearly be observed in the first few decades of post-independence. Its imperative role in financing Malaysia's economic activities was mainly due to high export earnings on agriculture commodities such as palm oil and rubber. Nevertheless, in early 90's Malaysian government started to spend a lot in industrial sectors such as automobile, electrical and electronics. These sectors were believed to produce better revenues and more significant impact on Malaysian economic growth (Fahmi, Samah, & Abdullah, 2013; Wong, 2007).

During the global economic and financial crisis in 1997, Malaysian industrial sector faced severe downfall. Agriculture sector later acted as a saviour of the Malaysian economy as its contribution towards GDP increased from RM17.1 billion in 1995 to RM18.2 billion in 2000 (8<sup>th</sup>Malaysia Plan), which later attracted government attention to reemphasize on this sector (Fahmi *et al.*, 2013). The agriculture sector has been

identified as the third engine of economic growth after manufacturing and service sectors. Subsequently, agricultural related courses in local universities such as biotechnology, agricultural sciences and agribusiness started to receive massive attention in order to produce specialist and researchers in agricultural fields (Fahmi *et al.*, 2013). This sector will continually act as an important sector for government programs in poverty alleviation. Hopefully, the current stigma which associates agriculture with rural area and poverty will be removed and the sector will be viewed as a modern and commercially viable sector with high returns.

The Malaysian government takes serious action to keep improving the agriculture sector in the nation by allocating sums of RM3.8 billion for the agriculture sector in 2012 Budget (DOSM, 2010; EPU, 2012). There are many industries in Malaysia agriculture sector, such as plantation, fisheries, livestock, apiculture, herbal based, swiftlet and others. Among the industries, swiftlet industry has been recognised as a unique global agriculture sector and even in Malaysia (Suriya, Zunita, Rosnina, Fadzillah, & Hassan, 2004). As a standing prove swiftlet bird nest industry was listed as a 2<sup>nd</sup> Entry Point Project (EPP) under National Key Economic Area (NKEA) in which the government expects the industry to contribute sums of USD3.6 billion to the nation's income by 2020 (Economic Transformation Programme (ETP), 2011).

## 1.2 Swiftlet Industry in Malaysia

Most of the techniques in Malaysian swiftlet ranching were adapted from Indonesia. Indonesia is the pioneer of custom built swiftlet ranching activities in the world (Mardiastuti, 2011). An unplanned encounter took place in East Jawa back in 1880, as the first few swiftlets ranching originated. It is believed that it was by sheer luck that the swiftlets colonized them. Swiftlets ranching gradually has become popular industry. In the 1970's, Indonesia swiftlet industry players made a great effort for modifications and improvements inside the houses in order to emulate the cave-like conditions. To date, Indonesia has 50% to 60% world market share (Mardiastuti, 2011). The industry of swiftlet ranching in Indonesia has the history of more than a century. The establishment of the swiftlet bird houses in Malaysia was originated from Indonesia (Lim, 2011).

The swiftlet ranching in Malaysia still in its growth stage, compared to the pioneer producer, Indonesia. The swiftlet ranching is a relatively new industry in Malaysia as compared to other established and long-standing industries such as rubber, oil palm, oil and gas, timber, financial services and small and medium industries (SMI) manufacturing (Merican, 2007). The Malaysian swiftlet industry especially in ranching activity has achieved critical mass during the past 10 years (Lai, 2010).

The swiftlet industry in Malaysia started to boost the momentum after the Asian Economic Crisis in 1997 to 1998. During that period, many businesses, especially small and medium enterprises (SMEs) had experienced hard times and a great number of them closed down the business throughout the country. The premises were left empty because no other business sprung up to take their place as a result of the depressed economic environment at that time (Merican, 2007).

Rather than leaving their properties such as buildings and shop lots idle, some of the property owners decided to convert their untenanted properties into swiftlet bird house. At that time, the technology and the idea of swiftlet ranching activity were mainly adopted from the world pioneer producer, which is Indonesia. Back in the 1990's, forest fire in Indonesia has created an excellent opportunity for Malaysia. The resultant haze and the open burning in Indonesia has led to millions more swiftlet birds migrating to West Malaysia. At the same time, the Malaysia cave swiftlet birds had chosen a better habitat and change their habitat from cave to bird house (Mardiastuti, 1996; Mardiastuti, 2011).

The Malaysian SME executives, property owners and investors began to realize the financial viability of the swiftlet industry and the availability of swiftlet birds in Malaysia. They also realize the demand for the EBN in the world market is very high and the supply is limited. The investment in Malaysia swiftlet industry started to rise and many birdhouses were established. Since then, the number of bird house has increased tremendously (Merican, 2007). The major swiftlet ranching activity is mostly conducted



in secondary and tertiary townships, where food source for the swiftlet birds is abundant and pollution levels are relatively minimum. Table 1.1 shows the earliest towns used to conduct ranching activity in Malaysia.

**Table 1.1. Earliest Towns Used to Conduct Ranching Activity in Malaysia**

<b>State and Name of Place</b>	
<b>Johor</b>	Rompin
Bukit Pasir	<b>Pahang</b>
Jemaluang	Pekan
Kampung Air Papan	<b>Perak</b>
Kampung Sawah Datuk	Bagan Serai
Kampung Seri Pantai	Bruas
Kulai	Cangkat Jering
Mersing	Pantai Remis
Pontian Kecil	Parit Buntar
Senai	Lumut
Tai Hong Village	Selama
Tangkak	Setiawan
Ulu Tiram	Slim River
<b>Kedah</b>	Tanjung Malim
Jitra	Teluk Intan
Kampung Pinang	<b>Perlis</b>
Kampung Tanjung Radin	Kampung Banat Bawah
Kuala Ketil	Kampung Tasoh
Kuala Nerang	Kampung Tebing
Kulim	<b>Pulau Pinang</b>
Lunas	Bukit Mertajam
Legong	Cangkat Kledang
Pokok Sena	Kepala Batas
Sungai Petani	Nibong Tebal
<b>Kelantan</b>	<b>Selangor</b>
Pasir Mas	Kepong
<b>Melaka</b>	Kuala Kubu Bharu
Alor Gajah	Rawang
Ayer Pasir	<b>Terengganu</b>
Durian Tunggal	Kuala Besut
Kampung Machap	Kuala Terengganu
<b>Negeri Sembilan</b>	Tok Soboh
Jelai	<b>Wilayah Persekutuan Kuala Lumpur</b>
Kampung Baru Paroi	Cheras

Source: Adapted from Merican (2007)

The major demand for the EBN comes from China, Hong Kong, Taiwan, Macau and other Asian countries (Merican, 2007; Lai, 2010). The international trade for bird nest is getting wider. The Malaysian government has boosted the industry by funding the research and development (R & D) on swiftlet ranching. A guideline was drafted for swiftlet ranching by the DVS of Malaysia. The guideline is named as “Good Animal Husbandry Practice for Edible-Nest Swiftlets *Aerodramus* Species Ranching and Its Premises” and it was published in 2011. The guideline is mainly describing the location of bird house, sound playing time, transportation of bird, animal welfare and many more. It helps the ranchers to conduct the ranching activity in the right way and without harming the environment (Abdul Kadir, 2011b). Before 1998, it was estimated that only 900 units of swiftlet bird house were operated in Malaysia, but at the end of 2006 the number of bird house was increased to 36,000 units throughout the nation (Merican, 2007). The industry continues to boost up and more bird houses were built. In 2008, the total bird house in Malaysia was estimated about 50,000 units (Lai, 2010).

According to the DVS of Malaysia most of the ranchers prefer to use their own method and most of them did not register their bird houses with local council or state veterinarian office. In 2012, there were only 6,860 registered bird houses in all states in Malaysia. Table 1.2 shows the number of bird house registered in each state in 2012.

The highest number of bird houses registered was in Johor, which accounted for 1,916 units followed by Perak and Selangor with 1,615 units and 692 units respectively.

**Table 1.2. Registered Swiftlet Bird House in 2012**

State	No. of bird house (units)
Johor	1,916
Perak	1,615
Selangor	692
Pahang	583
Terengganu	513
Sarawak	486
Negeri Sembilan	413
Kedah	182
Pulau Pinang	143
Kelantan	125
Melaka	95
Sabah	54
Perlis	29
Wilayah Persekutuan Kuala Lumpur	14
<b>Malaysia</b>	<b>6,860</b>

Source: DVS, (2013)

The swiftlet industry in Malaysia has generated high economic returns to the country, with the return of RM1 billion in 2008 accounting for 6% of the world's total production, hence has placed Malaysia as the second largest birds' nests producer in the world after Indonesia (Eco Park, 2010). Swiftlet industry is currently a booming industry in Malaysia, which is expected to generate income of USD3.6 billion to the nation by 2020 (ETP, 2011). The main product in the swiftlet industry is an EBN, which is mainly produced by swiftlet birds. There are few species of swiftlet birds identified that are able to produce the EBN for human consumption.

The EBN export quantity and value for 1990 to 2012 are presented in Table 1.3. It is clearly showed that in 2011 the export value reached the maximum amount with total export quantity of 19.02 metric tonnes, while export value was RM69.02 million. The

data shows that export of EBN has increased from 2006 until 2011. Since early of July 2011 when China refused to import EBN products from Malaysia due to the nitrite (a common food preservative which is carcinogenic if consumed beyond safety levels) (Merrill, 1978) content in bird's nest is beyond safe levels (Kadir, 2012; Lim, 2011, Selangor Times, 2011), the export value decreased. The major importer of Malaysian EBN is China. Thus, ban gave a significant impact to Malaysia's export value.

The industry suffered its first blow when China banned Malaysian bird's nest in early of July 2011 (Selangor Times, 2011). Under the Malaysia Food Regulations 1985, the accepted level of nitrite in bird's nest in Malaysia is 30 parts per million (ppm). However, China has imposed a total ban on nitrite in bird's nest, which was almost impossible to achieve (Ramli, & Nizam Azmi, 2012). This caused export value in 2012 to decrease drastically to RM14.28 million, which was about 79.31%.



**Table 1.3. EBN Export Quantity and Value, 1990-2012**

<b>Year</b>	<b>Export Quantity (MT)</b>	<b>Export Value (RM' million)</b>
1990	26.20	7.30
1991	18.14	7.24
1992	9.09	4.28
1993	8.17	6.16
1994	2.36	3.07
1995	1.53	2.49
1996	4.60	3.06
1997	8.60	9.33
1998	20.44	12.05
1999	13.84	11.36
2000	17.73	11.47
2001	15.19	18.77
2002	14.25	12.88
2003	14.00	20.82
2004	11.74	14.81
2005	6.87	10.34
2006	4.47	7.16
2007	9.04	12.97
2008	11.12	24.47
2009	10.46	30.48
2010	17.98	56.59
2011	19.20	69.02
2012	7.52	14.28

Source: DOSM (2013)

It is estimated that in 2015 the total production of EBN in Malaysia will be 502 metric tonnes (Abdul Kadir, 2011a). While for 2020, it is estimated that Malaysia will be producing 870 metric tonnes of EBN for global market consumption. The forecasted export value of EBN for 2015 was RM1.7 billion (Abdul Kadir, 2011c; Kadir, 2012). By 2020 it was forecasted that Malaysia will be able to export more than RM5 billion worth of EBN (Kadir, 2012).

From the statistics, Malaysia is expected to remain as a second world largest EBN producer and gain more global market share for EBN products. According to the DOSM in 2011, the total wages paid for swiftlet industry was RM522,000.00 while the total value added in the swiftlet industry was more than RM2 million (DOSM, 2011).

### **1.3 Issues and Challenges in Swiftlet Industry**

Malaysia's multimillion ringgits bird's nest industry has been hit hard by China's ban and a series of scandals. The demand for EBN has dropped between 20% and 30%, while prices have fallen by 20%. According to one of the Bird's Nest Association president, the selling price of bird's nest has dropped from RM4,500 to RM4,800 per kilogramme to RM3,800 to RM4,000 per kilogramme (Ramli, & Nizam Azmi, 2012).

Most of bird houses in Malaysia operate without a proper licence and permit. Based on ETP Annual Report (2011) most of swiftlet ranchers chose not to register with the government to avoid tax. Total number of swiftlet bird house registered under the DVS in Malaysia until 2010 was 7,119 units. The Malaysia government recognized that swiftlet industry has a huge potential to be developed and the government has been included swiftlet ranching in the NKEA agriculture programme (ETP, 2011). The agriculture NKEA focuses on transforming a traditionally small-scale, production-based sector into a large scale agribusiness industry that contributes to economic growth and sustainability. Bird nest industry is listed in EPP as an industry that can contribute sums of USD3.6 billion to the nation's income by 2020 (ETP, 2011).

As Merican (2007) reported that there were only 900 units of swiftlet bird house in 1998. However, at the end of 2006 the number of swiftlet house has increased to 36,000 units and in 2008, the number of swiftlet house operated in Malaysia has reached 50,000 units (Lai, 2010). This tremendous increment in the number of the bird house in Malaysia has shown that it received high attention from players. However, there are problems and the increment in numbers of bird houses has caused several warning and issues.

Malaysian producers must be very competitive in order to fulfil the import countries requirements (Kadir, 2012). The product must be in primer quality to win market share. Uneven quality will affect the entire EBN market. When China rejected Malaysian EBN, the entire market was affected (Kadir, 2012; Lim, 2011). The price of EBN felt drastically and most of the ranchers only received minimum pay for their yield. Another issue is related to the sound pollution caused by swiftlet ranchers and it becomes great threat for the sustainability of the industry. According to Kadir (2012), the harmony of swiftlet industry was disturbed due to the sound pollution. The harmony of the industry merged environmental friendly development, development in terms of social and economic perspective for a long term. In short, sustainability of the swiftlet industry was questionable.

#### 1.4 Problem Statement

The swiftlet ranching activities mainly rely on the nature and environment. Thus, the environment factor is the main concern in the swiftlet industry as to keep the industry for a long term. Kamarudin and Abd. Aziz (2011) explained that uncontrolled development of swiftlet houses can cause a sustainable risk to the industry. One of the main issues is environmental disturbance for public surrounding the bird house. Swiftlet ranchers commonly use 'bird calling sound' to attract the birds and build their nests in the bird house. The ranchers will keep on playing the sounds from morning until evening to attract more birds to come to their bird house. Some of the ranchers convert the shop lots into bird house, which is near to the residential areas. This will create some disturbance to the public and sound pollution to the residents. Ooi (2011) reported that swiftlet breeders in the heritage house in Penang have caused environmental problems and disturbances in the surrounding community. It has indirectly affected the quality of surrounding community life. Furthermore, the DVS Malaysia has received many complaints from the public regarding the way ranchers manage the swiftlet bird houses particularly with bird calling sound.

Due to high price of EBN, there is a great pressure on the population of White-nest Swiftlets (*Aerodramus fuciphagus*) in Malaysia (Hobbs, 2004). The ranchers will collect the nest before the young bird able to fly. This has caused stress on swiftlet bird and its population level. This harvesting method will give negative effects to the population of the swiftlet, because it leads to the swiftlet birds migrate to other birds' houses or even



migrate to other places as well. Wrong harvesting method can seriously endanger the swiftlet species (Lim & Cranbrook, 2002a).

There is also an issue about quality of bird nests and amount of nitre content in EBN which is produced in the swiftlet bird house. The quality of bird nests will decrease because of the bird's droppings. When large numbers of swiftlets are confined in a small place, with accumulated droppings and bad air-circulation, the quality of nests will certainly drop (Lim, 2011). The birds' droppings and swiftlet house cleanliness (Kamarudin, 2012) can influence the nitre level in EBN (Ministry of Health Malaysia, 2012). Guano or birds' dropping is a waste and actually a by-product of swiftlet industry. Waste management is an issue that needs to be seriously considered by the ranchers and efficiency in managing waste management is definitely required certain level of knowledge among the ranchers. Thus, the ranchers must have a favourable attitude to practise sustainable waste management.

The sustainable issues are contributed mainly by the ranchers themselves. The sustainability of any industry strongly relies on the player's knowledge, attitude and practices towards sustainability of that particular industry. The same setting goes to the agriculture industry, where farmer's knowledge, attitude and practices on sustainable agriculture play a crucial role in sustainable farming (Röling & Jiggins, 1998). In the swiftlet ranching industry, the rancher's knowledge level is very important in order to maintain the sustainability of the industry. The ranchers must be knowledgeable to

practice sustainable ranching activities. If sustainability in ranching practises is still lacking, thus it can negatively impact the swiftlet industry.

In the light of the above discussions, all issues discussed are related to the environmental aspects. The sustainable practices in the swiftlet industry are a vital point to drive the industry for a long term. The scenarios in the industry reflect that the industry is still lacking in terms of sustainable practices. To implement the sustainable practices in the swiftlet industry, the ranchers must have a desirable attitude on sustainable ranching which is driven from fundamental knowledge on sustainable swiftlet ranching.

### **1.5 Research Questions**

In this study five specific research questions were addressed. The entire research questions were developed based on rancher's knowledge, attitude and practices (KAP) levels and sustainable swiftlet ranching practices.

1. What is the knowledge, attitude and practice levels of swiftlet ranchers in terms of sustainable swiftlet ranching?
2. What is the relationship between knowledge, attitude and practice levels of swiftlet ranchers?
3. What is the relationship among knowledge, attitude and practice level and swiftlet ranchers' socio-demographic profiles?

4. What are factors that influence sustainable swiftlet ranching which affect ranchers' knowledge, attitude and practice levels of swiftlet ranchers towards sustainable swiftlet ranching?
5. What are the effectiveness of EBN production and socio-demographic profiles on swiftlet ranchers' KAP levels?

### **1.6 Objectives of the Study**

The general objective of this study is to determine KAP levels of swiftlet ranchers towards sustainable swiftlet ranching. The specific objectives of this study are as follows:-

1. To investigate the knowledge, attitude and practice levels of swiftlet ranchers towards sustainable swiftlet ranching.
2. To determine the relationship between knowledge, attitude and practices levels of swiftlet ranchers.
3. To examine the relationship among knowledge, attitude and practices levels and swiftlet ranchers socio-demographic profiles.
4. To determine factors that influence sustainable swiftlet ranching which affect the ranchers' knowledge, attitude and practice levels of swiftlet ranchers towards sustainable swiftlet ranching.
5. To determine the effectiveness of EBN production and socio-demographic profiles on swiftlet ranchers' KAP levels.

## **1.7 Significance of the Study**

This study will help all the industry players such as ranchers, policy makers, traders and importers to improve their level of awareness in sustainable swiftlet ranching. By identifying the ranchers' knowledge level in terms of environmental aspect, the industry players could improve and increase the EBN production. The study also helps the ranchers to produce and improve the quality of EBN in Malaysia by practising more sustainable swiftlet ranching. The results of this study will help to assist the policy makers and other players in the industry to make decision regarding the development of swiftlet industry and at the same time focus on the important factors that will drive the swiftlet industry for a long term. The findings of this study will help to improve the upstream activities of swiftlet ranching industry, which will keep the industry sustain for a long term.

## **1.8 Organization of Thesis**

The thesis is organized into five chapters. The first chapter begins with the introduction which includes issues and challenges in the swiftlet industry, statement of the problem, the research questions and the objectives. The second chapter reviews the literatures on past studies and information which are pertinent to the study. The third chapter explains the research methodology, including sampling techniques, methods of data collection, description of the study areas and tools for data analysis. The fourth chapter provides an in-depth discussion on findings of the study. In the last chapter, the conclusions and

limitation of the research are discussed. In addition, recommendations for future research are also addressed.



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