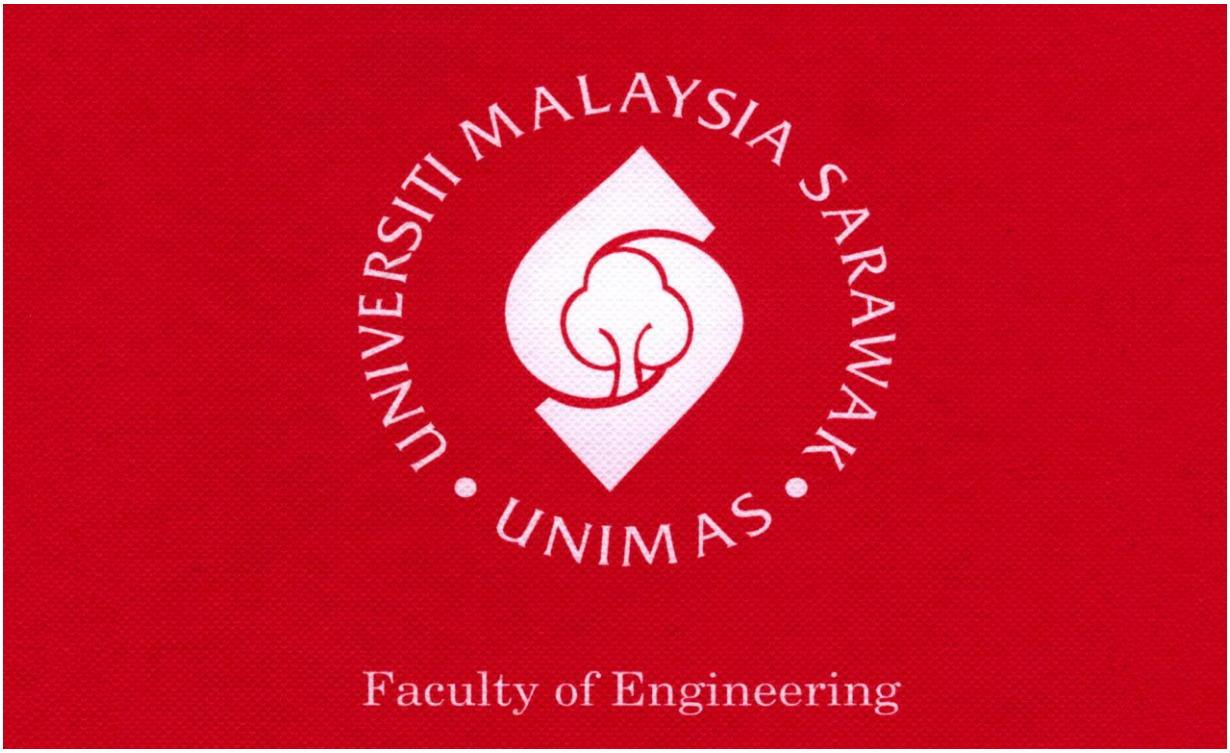

DESIGNING SWIFTLET FARMING USING ENERGY PLUS

Frezzal bin Faisal

Bachelor of Engineering with Honours
(Civil Engineering)
2009

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FREZZAL BIN FAISAL

This project is submitted in partial fulfillment of the requirements for

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UNIVERSITI MALAYSIA SARAWAK

2010

“To my cherished family and

for all Malaysian swiftlet farmers.”

UNIVERSITI MALAYSIA SARAWAK

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Judul: DESIGNING SWIFTLET FARMING USING ENERGY PLUS

SESI PENGAJIAN :2009/2010

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ABSTRACT

The swiftlet farming is a new type of business that is gradually growing in our country. Swiftlet farming can be defined as the conversions of people-centric buildings into buildings used to house and protect a certain species of swiftlets. Swiftlets are being lured into these buildings with the purpose of collecting their valuable bird nest. This method is more efficient compared to the traditional method of bird-nest harvest and can ensure the preservation of the swiftlet population. Constant attention and involvement from a lot of people and different organizations cause the swiftlet farming to undergo a lot of development and research to expand the industry. Different types of material and designs of swiftlet farms are being created to cater the needs of the swiftlets. The different aspects of building construction such as the orientation of the building, the wall materials and designs and also the roof aspects have a significant effect to the suitable environment for the swiftlets. With the various available materials and designs exist, the most preferable options are being chosen to minimize the investment and to avoid further problems occur.

ABSTRAK

Pertanian burung walet ialah sejenis perniagaan baru yang berkembang secara beransur-ansur di negara kita. Pertanian burung walet dapat ditakrifkan sebagai penukaran bangunan-bangunan sentrik manusia ke bangunan yang digunakan untuk memelihara dan melindungi spesies tertentu walet. Walet dipikat ke dalam bangunan-bangunan ini dengan tujuan mengumpul sarang burung mereka yang berharga. Kaedah ini lebih berkesan berbanding dengan kaedah tradisional tuaian sarang burung dan boleh menjamin kelestarian populasi walet. Tumpuan berterusan dan penglibatan dari ramai orang dan organisasi yang berbeza menyebabkan pertanian burung walet mengalami banyak pembangunan dan penyelidikan bagi membangunkan industri ini. Pelbagai jenis bahan dan rekaan-rekaan ladang-ladang burung walet diciptakan untuk memenuhi keperluan burung walet. Aspek yang berbeza bagi pembinaan bangunan seperti orientasi bangunan, bahan dinding dan rekaan serta aspek bumbung mempunyai pengaruh signifikan terhadap persekitaran yang sesuai untuk walet. Dengan pelbagai bahan dan rekaan yang sedia ada, pilihan utama sedang dipilih bagi meminimumkan pelaburan dan untuk mengelakkan masalah lebih banyak daripada berlaku.

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CHAPTER 1

INTRODUCTION

1.0 Swiftlets

Swiftlet are a type of highly aerial birds. Swiftlets are always being mistaken as the same species with their counterpart, the swallow. However, the only similarities with swallows are their outward appearance. Swiftlets are insectivores, where they eat insects from the *hymenopterans* classes (comprising sawflies, wasps, bees and ants) and *dipterans* classes (mosquitoes, gnats and midges).

Normally, the swiftlets fly from their nests and goes foraging in the skies for insects before dusk. Swiftlets usually breed in the wet season because during this time, foods are easy to get and they must incubate their eggs with their body heat to create suitable conditions for the eggs. A pair of swiftlet can only produce up to two eggs in one mating session and the male and female swiftlet will take turn incubating

the eggs during period. According to Langham (1980), the birds bred throughout, but laying was concentrated in the period October to February. Incubation and fledging periods were 23 ± 3 days and 43 ± 6 days, respectively.

The swiftlets make their nests using their own saliva compared to other birds that uses grasses and mud as their material in building nests. The swiftlets bird nests can enhance and improve the immune system and the health of the human body. This is because the saliva of the swiftlet has several chemical compositions and amino acids that are proven to give nutrition and energy to the human body.

1.1 Swiftlet Farming

According to Merican (2007), swiftlet farming is defined as the conversions of people-centric buildings into buildings used to house and protect a certain species of swiftlets (in this case, the white edible birds' nests swiftlets or the *Aerodramus Fuciphagus* species of swiftlets) that can only be found in the South East Asian region as well as the design and construction of purpose-build buildings for the purposes of accommodating such swiftlet populations as well.

A continuous vocalization of swiftlet chirps and mating sounds are played throughout each and every day using speakers and audio systems installed within such buildings in order to lure the swiftlets that are flying overhead to fly into the

said buildings to mate and make the buildings their new home. In other word, swiftlet farming is a man-made effort to promote and to assist the production of the swiftlet bird nests in a controlled habitat with the help of modern technologies.

1.1.1 History of Swiftlet Farming

The original habitat of these swiftlets is in the caves that are available in the Peninsular Malaysia and Borneo. Swiftlets nest from caves had been commercialized in Malaysia for over more than 100 years. The first excavation birds nest record was at Niah Caves, Sarawak in 1878. According to Leh (1993), in Sarawak Bird's nest caves are found throughout Sarawak. However most of the edible white-nests are found in caves in the coastal islands, Suai and Baram. The black-nest swiftlets on the other hand nest in limestone caves in Lundu, Bau, Lingga, Klingkang, Tatau, Tinjar, Dulit Range, Similajau, Niah, Subis, Mulu and Merapok.

The initial factor of swiftlet farming is being caused by the 1990's forest fire at Indonesia due to deforestation process. The incident caused heavy haze and loss of habitat for the swiftlets. This has force a mass migration of swiftlets from Kalimantan into Sarawak in search of a new habitat. The second factor is the Economic Crisis of 1997-1998. The crisis cause a lot of shop houses being closed due to business failures and economy breakdown. This has caused the building owners to involve themselves in the swiftlet farming industry rather than leaving the building becomes idle.

The modern swiftlet industry in Malaysia is new compared to the involvement of swiftlet farmers in Indonesia and Thailand. In Malaysia, the swiftlet farming is widely practiced in secondary and tertiary townships where food source is in abundance and pollution levels are at their relative minimum. However, some swiftlet farming is also being done at the city where the farmers converted the empty shop houses and premises into a functional swiftlet farm.

1.1.2 Economy Impact Due To Swiftlet Farming

The industry of swiftlet farming can be done at various zones where swiftlet sightings and breeding zones exists. With the increasing demand from Hong Kong and China for these swiftlet bird nest, the industry of swiftlet farming have grown widely in South East Asia where the preferred species that produce the edible white colored nests lives. This is also being induced with the fact that these swiftlet bird nests are more profitable and easy to be done than other farming business. Hence, some of the farmers have dubbed the swiftlets nests as the 'white gold' because of its profitable earnings.

According to Kuan *et al* (2005), Malaysia is currently the third largest producer of edible birds' nests (7% of gross supply value) in the world, behind Indonesia (60%) and Thailand (20%). As for the current market prices for the swiftlet bird nests, a kilogram of unprocessed white edible birds' nests (around 90 to 120 nests) is

able to fetch production level prices of RM 4,500 to RM 6,000 in 2006. A kilogram of processed white edible birds' nests is able to fetch retail level prices of RM 15,000 to RM 25,000 in 2006 in Hong Kong and China. With the huge profit and steady income for each month, it is not strange that a lot of entrepreneurs are willing to involve in swiftlet farming.

Table 1: Comparison of the traded metal commodities with white edible bird nests

Materials	**Value (RM/kilogram) (in year 2006)**
Copper	11.50
Nickel	45.23-57.62
Silver	1,300 - 1,550
Gold	67,500 – 79,450
White edible bird nests	4,300 – 6,500 (depending on the quality)

Other economical benefits from swiftlet farming are from the guanos. Guanos are the excrement from the swiftlet birds. They are rich in nutrients because the swiftlets only eat insects. These guanos can be used as organic fertilizers. It is rich in nitrogen and phosphates, which is good for the crops. Most of the swiftlet farms have collected the guanos for trade. The trade can be done in two ways. One is for main purposes of guanos and that is as fertilizers. The other is for original aroma supply for swiftlet farms. Swiftlet farmers use the guanos to attract more swiftlets in the building as it will make the swiftlets feel more comfortable.

1.1.3 Problems Arise Due To Swiftlet Farming

Due to some factors and lack of guidance in swiftlet farming, a lot of swiftlet farmers have failed in their business. This is because some farmers have little knowledge and tend to leave the proper design and care to their contractor or consultant. With these problems, some farmers are easily deceived by their trusted consultant about the proper care of the swiftlet farming. There are also some environmental factors that affect the success of the swiftlet farming. This is because, in this industry, although the income looks promising, the procedure and care of these farms are hectic and troublesome.

Other relevant problem is because of the misplacement of the swiftlet farms. Some of the swiftlet farms are being constructed near the housing and conventional town centre activities area. This has cause local residents to voice strong complaints about noise and droppings from the birds. They claim that the farmers have let the tweeters (speaker for attracting swiftlet) to operate without consent from the neighborhood. The guanos are also not attended properly causing pungent smelly odor to the surrounding areas.

Due to the increasing failure rates and the environmental effects of this swiftlet farming to the community, the government has organized a proper guide and law regulations to educate and restrict the development of this swiftlet industry in Malaysia. In those guide and law regulations, the government have include the need

of license and proper conditions that should be fulfill by the swiftlet farmers. Kuan and Lee (2005) also describe the laws and regulations that have been implemented in Malaysia regarding swiftlet farming.

- Residential properties that are zoned as completely residential are not allowed to be converted into swiftlet farms. Eg. Residential houses, apartments, townhouses, bungalows, etc.
- Buildings which are zoned for commercial use are allowed to be converted into swiftlet farms.
- Areas that are zoned for agricultural use can be used for swiftlet farming on condition that the relevant council gives approval to change the use of the land from agricultural use to building use.
- The ground floor of the property is not allowed to be converted into a swiftlet farm, unless a special approval is obtained from the relevant council for such a use.
- The building must not be higher than 5 floors in order for the relevant council to give approval for the conversion into a swiftlet farm.

The swiftlet farming in Sarawak is also being supervised by the state government. According to Uning (2001), the trade of the edible birds' nests in Sarawak includes collecting, selling, buying, importing and exporting, and has contributed to government revenue in the State. Under the Wild Life Protection Ordinance 1998 and its subsidiary legislation the Wild Life Protection (Edible Birds' Nest) Rules 1998, all swiftlets are legally protected in Sarawak. Thus, all collection, selling, buying, imports and exports of birds' nests require a license. Implementation of these laws falls under the jurisdiction of the Forest Department. Two other

Government agencies are also involved, namely the Agriculture and Customs Departments.

Figure 1.1, Figure 1.2, Figure 1.3 and Figure 1.4 shows the different ‘types’ or layout of swiftlet farm located in different locations in Sarawak.

Figure 1.1: A swiftlet farm in Sarikei, Sarawak.

Figure 1.2: A swiftlet farm in Mukah, Sarawak.

Figure 1.3: A swiftlet farm in Mukah, Sarawak.

Figure 1.4: A swiftlet farm in Santubong, Sarawak.

1.2 Aim and Objectives of the Study

In the swiftlet building, the surrounding environment must be suitable for swiftlets to live in. This is important because the purpose of swiftlet farming is to lure the swiftlet into the building for them to breed and produce offspring. With higher rate of breeding, more bird nests can be harvested from the swiftlet building.

The swiftlet building must be designed with proper consideration and planning. This also includes in material choosing for the design and building of the swiftlet farms. This is due to some circumstances that could affect the production of bird nests and habitat of the swiftlets. In addition, the choice of materials and design will affect the initial funds for constructing the swiftlet building. The investor would want to gain more based on their investment of their project investment business.

With proper planning and care of these swiftlet farms, the business will thrive in time. This is because swiftlets that are satisfied with the living conditions in the swiftlet farms will breed more. This will increase the rate of production of the swiftlet bird nests.

Swiftlets are very particular in choosing their home. This is due to some macro and micro factors that are related to the original habitat of the swiftlets. That is why; more research and knowledge have to be obtained in order to be success in the swiftlet industry.

The objectives of the study are:

1. To create a suitable environment for the cultivation of the swiftlet in the swiftlet building.
2. To design an economical building without affecting the habitat of the swiftlets.
3. To promote the growth and production of the swiftlets.
4. To analyze the macro and micro factors that is related to the swiftlet farming.