

## A STUDY ON THE EDIBLE-NEST SWIFTLET MANAGEMENT AND PRODUCTION IN NORTH SUMATERA

Yono C. Raharjo<sup>1</sup> and Arnold P. Sinurat

### ABSTRACT

A survey-based study was conducted to study the farming management of edible-nest swiftlet (*C. fuciphaga*) at various areas in the eastern part of North Sumatera, and production of edible swiftlet nest of *C. fuciphaga* and *C. maxima* from houses and/or caves in North Sumatera. Nest from caves was mainly obtained from the western part of North Sumatera. The study was based on (i) observation of swiftlet-house environment, (ii) interviews with the swiftlet-house owners at five cities along the way from Medan to Kisaran, and (iii) data from government offices [Natural Resources Offices of the Ministry of Forestry and Regional/District Offices] as well as from other corresponding organizations, e.g. Cooperative and Farmers Association. Results showed that development of farming edible-nest swiftlets raised high interests in all cities visited. Noted that in 1989-1990, swiftlet houses in Lubukpakam and Kisaran were only less than 10, but nowadays 1997] almost 300 to 400 swiftlet houses in each of the areas have been built. In term of farming management, three distinct characteristics that are different from swiftlet-houses in Java, are there is always 'breeding room', 'water pond' and wide entrance ['windows'] for birds of every newly built house. Light breaking management was simple but effective to please bird to stay. Harvest management, although varied between farmers, was carefully planned in order to maintain sustainable population. Recorded nest production for 1997 [up to September] for *C. fuciphaga* [house], *C. fuciphaga* [cave] and *C. maxima* [cave] were 4,485 kg, 650 kg and 5,750 kg, respectively. Annual production increases from 1994 for the corresponding species were 35.95 %, 14.05 % and 11.31 %, respectively.

Keywords : Swiftlet farming, nest production, North Sumatera

### INTRODUCTION

Unless otherwise stated specifically, the word 'nest' always refers to the 'edible-nest' produced from swiftlets of the *C. fuciphaga* and/or *C. maxima*.

Swiftlet (*Collocalia spp.*) is one among many highly potential natural resources, native to Indonesia, that has been overlooked and hence only little attention is paid for its production. In its potential, these birds' functions to participate in the environmental control as insect predator, and economically also serves to provide high value edible-nest that generates income to the involved community.

Among many species of *Collocalia*, two are most commonly known to produce economically high value nests, *C. fuciphaga* and *C. maxima*, that produces 'white nest' and

'black nest', respectively. Indonesia, as a home range of many swiftlet species (Chantler and Driessen, 1995, cited from Mardiasuti and Mranata, 1995), exported about 120 tonnes of processed bird-nests in 1995 (Mardiasuti and Mranata, 1996), valued up to USD 2,500 per kg (Mardiasuti and Suhartono, 1996) and is estimated to contribute up to 80 % of the world edible-nest market. Malaysia, the second largest producer produced 'only' 34,806 tonnes in 1990 (Er *et al.*, 1995) and was reported to decrease since 1982 due to high exploitation (Nugroho and Whendrato, 1994). Cited from Er *et al* [1995], other range countries such as the Philippine, Thailand, Myanmar, and India produced relatively small numbers of nests, ranged from 21 to 4,536 kg (Lau and Melville, 1994), or Vietnam, 2,800 kg (Nguyen, 1994).

<sup>1</sup> Balai Penelitian Ternak, PO Box 221 - Bogor 16002

The 120 tonnes exported nests from Indonesia were contributed from estimatedly 75 tonnes of raw white nests produced by the house-farming and from 10 tonnes of raw white nests + 200 tonnes of raw black nests produced from cave/wild harvest (Mardiastuti and Mranata, 1996). Noted that conversion of raw black nest to the processed nest is 16 - 25 % (Hoo, 1996, pers. comm.). Precedingly, Er *et al.* (1995) reported that recorded birdnest production from Indonesia in 1993 had reached about 328 tonnes, much higher than that of reported by Mardiastuti and Mranata (1996). This substantial difference is worth noting.

Noted that 'white nest' of *C. fuciphaga* produced from the 'house-farming' is contributing more and more economic returns, yet operational input costs are considered low (i.e. no feed cost), the interest to farm the animals is therefore high. The major limitations however are large amount of investment for building and the technology to manipulate the microenvironment in the building to make the birds to stay and reproduce comfortably. The farming technology' itself may vary among farmers, who usually are so secretive, and hence visitor is hardly allowed to enter the swiftlet houses.

Among many areas in Indonesia, Java is considered as the most developed in swiftlet farming and produced more than 55 tonnes of house-farm white nests, contributing more than 73% of the national production [Mardiastuti and Mranata, 1996]. Little is known on the development of edible-nest swiftlet farming or production from other areas, except that in North Sumatera and Lampung more and more swiftlet houses are being built. Considering the widespread distribution of swiftlets, vast habitat areas for swiftlets [including for feed supply] and the potential of farming, by means of proper farming technology, to increase nests production, the economic potential of these bird species is very high.

This research is carried out to study the development of swiftlet farming, the farming technology and swiftlet nest production in North Sumatera that may vary from those in Java.

## MATERIALS AND METHODS

The study was conducted in the Province of North Sumatera. For swiftlet house-farming, areas visited were mostly located in the eastern part of this Province, i.e. Medan, Lubuk Pakam, Parbaungan, Sei Rampah, Tebing Tinggi, Perdagangan and Kisaran. Cave swiftlet studied was those in the surroundings of western part of North Sumatera. Questionnaires were prepared and expectedly 2 farmers, traders and/or nest harvesters from each area studied could be interviewed. However, due to inavailability of farmers, including their reluctance to allow the Study Team to enter the swiftlet house, for the reason that it may disturb the birds' entity, the farmers interviewed were only from 5 areas mentioned, excluding Parbaungan. In addition, nest harvesters are usually also workers of the farmers, hence the information were also obtained from the farmers. For cave swiftlet, data was obtained from interview only, without having visited the caves, which locations are hardly reached within this time allowed.

Primary and secondary data were obtained by means of interviews and/or data collection with the swiftlet farmers, representative of regional swiftlet farmers association, staffs from the Regional Office of Forest Protection and Nature Conservation and from the Regional Office of Live stock Services, as well as with the members of Swiftlet Cooperative Group.

Information and data collected is presented descriptively and/or in the format of Table or Figure.

## RESULTS AND DISCUSSION

### *Development of Swiftlet House-Farming in North Sumatera.*

From the interviews and direct observation, areas that produced swiftlet nests in North Sumatera, including type and estimated numbers of sources are shown in Table 1. It was very unlikely to obtain accurate data for swiftlet houses nor for nests production officially. Most data obtained were from the interview with key farmers and traders. For example, official numbers of

Table 1. Area/Sub-District that produces edible-nest in North Sumatera (1997)

| Area/Sub-District | Type of nest-producing source | Estimated number of nest-producing source |
|-------------------|-------------------------------|---|
| South Tapanuli    | Cave                          | 3*  |
| Nias and Parapat  | Cave                          | NA*                                       |
| Medan             | House-farming                 | NA  |
| Lubuk Pakam       | House-farming                 | 300                                       |
| Perbaungan        | House-farming                 | 20  |
| Sei Rampah        | House-farming                 | <20                                       |
| Tebing Tinggi     | House-farming                 | >150                                      |
| Perdagangan       | House-farming                 | 10  |
| Kisaran           | House-farming                 | 400                                       |
| Tanjung Balai     | House-farming                 | NA*                                       |
| Galang            | House-farming                 | 1*  |

NA = not available; \*location was not observed, information was obtained from the traders.

swiftlet houses in Kisaran in 1997 were 67 (Anonymous, 1997), but brief on the spot observation (not the whole areas) have already shown > 130, and according to the Farmers Association were about 400 houses, excluding those are being built. Data presented here, therefore, are estimate.

Impressive development of house-farming of swiftlet took place at Lubuk Pakam and Kisaran. According to the local farmers, in 1989 there were less than 10 swiftlet-houses in each area, and nowadays there are 300 and 400 houses respectively and more and more are being built. Most of these newly built houses are 3 to 7 floors high. More than 50 % of these houses were reported to, at varying degrees, have been inhabited and producing nests. Development in the other areas was also newly started about 4 - 7 years ago. High interest to build swiftlet houses in these areas, apart from high value of the nest, were that (i) these areas are believed to be the cruising or even inhabitant area for swiftlet, (ii) food supply [insects] for the birds are abundant [close to the humid forest, rivers, agricultural areas], (iii) less pollution/ disturbance, and most importantly [iv] the species of bird entering the house is *C. fuciphaga*, the white-nest producing bird. Hence, less time is required to be a 'successful house-farming', as compared with the common practice in Java.

The common practice for house-farming of swiftlet In Java is initiated with the birds entering the house [mostly old and/or abandoned/less used houses]. The bird is *C. linchi*, which nests are built from grasses, pine leaves or other fibrous materials with a little portion of bird saliva, and therefore has only very little value compared with that of white-nest of *C. fuciphaga*. Gradually, the eggs of *C. linchi* are replaced by eggs of *C. fuciphaga* and, are then expected, that the population of *C. fuciphaga* dominate the house (Nugroho and Whendrato, 1994). This practice may take up to 8 years to be fully successful.

The cave-nests produced from South Tapanuli district were mostly came from the surroundings of Natal area, which yield 50 - 75 kg white nests and 2025 kg black nests for each harvest (Table 2). Harvests were conducted 3 to 4 times a year, depending on the season. A longer rainy season is reported to fasten nest making, producing more nests, hence making more frequent harvests. Black nest is produced by *C. maxima* and less valued than the white nest. Its ratio, from raw to processed edible-nest ranges from 15 - 30 % (Hoo, 1997, pers. comm). *C. maxima* inhabits caves and may not be found in the man-made microhabitat, and therefore is still unlikely to be house-farmed.

Table 2. Estimated mean production of nest from the cave/ wild harvest from each harvest

| Cave location     | Type of nest | Estimated production |
|-------------------|--------------|----------------------|
|                   |              | [kg/harvest]         |
| Desa Tabuyung     | Black        | 1500                 |
| Desa Singkuang    | Black        | 125                  |
|                   | White        | 50 - 75              |
| Desa Rantopanjang | Black        | 400                  |

### Technology of Swiftlet House-Farming in North Sumatra

House-farming of swiftlet, which mainly referred to those practiced in Java, have been published by many authors (e.g. Somadikarta *et al.*, 1989; Whendrato and Madyana, 1989,1990; Nugroho *et al.*, 1991, Nazaruiddin and Regina, 1991; Nugroho and Whendrato, 1992, 1994; Marzuki, 1994; Wibowo, 1995; Iswanto, 1997). Therefore, only different farming-technology observed in North Sumatera and that reported in Java, that are discussed in this manuscript.

#### a. Micro-environment

Inside building structure and microenvironment found in most swiftlet houses, in general, were similar; i.e. consisting of wall partition, small rooms, wide roving area, water buckets, wooden ceiling fins for nest attachment; specific smell, hot, humid and dark environment. Measured temperature and relative humidity (Rh) in the swiftlet houses from two places were similar, ranged from 26 - 29 °C and 66 - 78 %, respectively (Table 3).

Ranges of temperatures are similar to those reported by Marzuki (1994) and Nugroho and Whendrato (1994), 26 - 29 °C and 28 °C, respectively, but are much lower for the Rh values, i.e. 85 - 95 %. This Rh difference is interesting, because inside the building, buckets filled with water were available at all time, as is

also the case for swiftlet houses in Java. In addition, these two swiftlet houses are estimated to produce > 40 kg (Kisaran) and > 5 kg (Perdagangan) nests per 3 months, excluding the unharvested nests used for breeding purpose. This finding may well imply that this swiftlet species could comfortably adapt to such lower Rh environment, hence possible wider range of geographical areas could be applied for this species. A closer looks to the possible reasons for Rh difference is geographical, habitats or the presence of roof waterpond. Geographically, Kisaran and Perdagangan are located inland, somewhat far from the sea; habitats surrounding the area are closed to palm oil plantation; and roof waterpond cools down the inside-house temperature, hence reduce the evaporation.

#### b. Light intensity and opening for bird entrance

Inside of the swiftlet houses are usually dark. Light is almost unpreferred at all. However, swiftlet can tolerate light intensity up to 2 lux (Marzuki, 1994; Nugroho and Whendrato, 1994). Corresponding to the light intensity, swiftlet farmers in North Sumatera build houses with wide openings for bird entrance at 3<sup>rd</sup> to 7<sup>th</sup> floor (depending on the height of the buildings). As small as house-window size (0.75 x 0.50 m) up to a 1.50 x 2.00 m size openings were commonly found. Wider

Table 3. Mean value of temperature and humidity of swiftlet house, measured at daytime

| Location    | Range of Temp.( °C) | Rh (%)  |
|-------------|---------------------|---------|
| Kisaran     | 26 - 29             | 68 - 72 |
| Perdagangan | 27 - 29             | 66 - 78 |

openings cause more light intensity; but the farmers arrange the wall [wood or concrete] in such a way that break the light, yet still provide space for birds to freely fly around, and make the inner area totally dark. Wide opening at high floor is hard to be reached by thieves or burglars.

#### c. Waterpond

Most newly built swiftlet-houses at North Sumatera were provided with roof waterpond. In some houses, waterponds were also built inside or outside at particular floor. Main purpose of this waterpond is (i) to cool the temperature inside the house, in order to make a comfortable environment for the birds and indirectly to (ii) let some insects grow or play around and can be used as source of feed for birds' feed. It is interesting that, eventhough the water 'supply' is abundant, the Rh is low and almost no 'sweaty' feeling is felt in the house.

#### d. Breeding rooms

Breeding rooms' for swiftlet are also provided in the most newly build swiftlet houses, particularly in the large houses, which have more than 3 floors. These rooms are made especially for birds to lay eggs, hatch and grow. The nests are not harvested, at least about 1 - 2 years or more. It is believed that breeding rooms, including the voice of young hatched birds, makes the birds to have 'bond' as their proper homestay and may also attract other birds to inhabit the house. This behavior is also believed to be so by a prominent swiftlet farmer/instructor in East Java. This practice is uncommonly done in the swiftlet houses in Java, especially when related to the possibility of 'environmental disturbance'.

#### e. Harvest

Nest harvest was usually carried out 3 - 4 times in a year, especially during the wet season, when nest construction takes place only 35 - 60 days, prior to the egg laying. The rule of thumb for this is that (i) nests are not harvested when more eggs have been laid or the chicks have already hatched, and (ii) nests in the breeding room are not subjected to harvest. Nguyen (1996) in the

observation of population management of cave-swiftlet in Khan khoa (Vietnam) also indicated that bird population is disturbed and tend to decrease when nest harvest is conducted at already more than 10 % of eggs have been laid. Following the recommendation of the Swiftlet Workshop in Surabaya (1996), the Directorate General of PHPA (Act No 25/KPTS/DJ-VI/97) also recommends that nest harvest (for cave swiftlet) is allowed only 3, and mostly 4 times per year and allowing the birds to hatch at least one cycle in a year at the time of most abundant feed supply available.

Nevertheless, in a seven-floor-swiftlet-house in Perdagangan, selective harvests (certain size and selected room) were conducted each week, except for the breeding room. About 150 to 200 pieces of nests could be harvested each week. The farmer, however, was unable to verify if the population decreased or increased, except that more and more swiftlets inhabit newly built rooms.

#### Swiftlet-nest Production

Data for bird-nest production from North Sumatera in 1994 up to September 1997 is shown in Table 4. This Table clearly indicated that nests production from North Sumatera, within the district or total, increased annually for both house-farmed swiftlet and cave swiftlet.

The rate of increase for *C. fuciphaga* in 1994-1995, 1995-1996, and 1996-1997 was 33.3 %, 40.62 % and 22.50 %, respectively. For *C. maxima*, the corresponding values were 995.2 %, 21.74 % and 2.68 %. The reasons for the decline of rate of increase from 1996-1997 were twofold, i.e. (i) production for 1997 was taken only from January to October 1997, whilst abundant production is usually during the wet season starting from September or October, and (ii) impact of long dry season (El Nino effect) and smoke due to forest fire. The later reason may have greater impact on wild/cave production. According to data reported by other trader, in 1995 North Sumatera is estimated to trade 2,981 kg farmed-house white-nests, 1,450 kg cave white-nests and 11,000 kg cave black-nests

Table 4. Swiftlet-nest production from North Sumatera [kg]\*

| Location         | 1994 |      | 1995 |      | 1996 |      | 1997 |      | Total |       |
|------------------|------|------|------|------|------|------|------|------|-------|-------|
|                  | C.f. | C.m. | C.f. | C.m. | C.f. | C.m. | C.f. | C.m. | C.f.  | C.m.  |
| Medan            | 300  | --   | 330  | --   | 375  | --   | 420  | --   | 1425  | --    |
| Lubuk Pakam      | 380  | --   | 530  | --   | 850  | --   | 950  | --   |       |       |
| Perbaungan       | 140  | --   | 150  | --   | 200  | --   | 300  | --   | 790   | --    |
| Sei Rampah       | 20   | --   | 30   | --   | 50   | --   | 80   | --   | 180   | --    |
| Begade           | 25   | --   | 35   | --   | 60   | --   | 100  | --   | 220   | --    |
| Tebing Tinggi    | 300  | --   | 500  | --   | 650  | --   | 725  | --   | 2175  | --    |
| Perdagangan      | 60   | --   | 80   | --   | 135  | --   | 160  | --   | 435   | --    |
| Kisaran          | 400  | --   | 550  | --   | 900  | --   | 1150 | --   | 3000  | --    |
| Pematang Siantar | 6    | --   | 8    | --   | 10   | --   | 15   | --   | 39    | --    |
| Tanjung Balai    | 120  | --   | 160  | --   | 250  | --   | 400  | --   | 930   | --    |
| Sibolga          | 40   | --   | 60   | --   | 100  | --   | 170  | --   | 370   | --    |
| Sidikalang       | 6    | --   | 8    | --   | 12   | --   | 15   | --   | 41    | --    |
| Tap-sel [Gua]    | 440  | 420  | 540  | 4600 | 600  | 5600 | 650  | 5750 | 2230  | 16370 |
| Total :          | 2237 | 420  | 2981 | 4600 | 4192 | 5600 | 5135 | 5750 | 14545 | 16370 |

\* Regional Swiftlet Farmer Association.

C.f. : *Collocalia fuciphaga* (white nest); C.m. = *Collocalia maxima* (black nes)

(Raharjo *et al.*, 1996). These differences may indicate that (i) production data is not necessarily comply with the trade data, (ii) not all data are revealed by the producers or traders, and a more likely reason is (iii) there is transfer of nest trading between provinces, e.g. some cave-nests from Aceh are purchased by traders in North Sumatera and re-exported to other places, and counted as nests from North Sumatera, etc. Survey on the marketing system may therefore necessary to trace the origin of nests for the purpose of regional potential/production.

### CONCLUSION

Swiftlet farming in North Sumatera is clearly developing, and the production of both cave-nests and farmed-house nests are increasing significantly. The farming technology, although partly is still depending on natural environment for feed supply, and to some extent differs from that in Java, is considered satisfactory. Considering vast areas of feed supply and suitability of macro environment, together with more improved technology for manipulating the microenvironment, the potential of farming

edible-nest swiftlet for higher production is high.

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