

TRADITIONAL KNOWLEDGE OF SUNGGAU SYSTEM, HONEY COLLECTING OF THE GIANT HONEY BEE (*Apis dorsata*) ON BELITUNG ISLAND; SOCIO-ECONOMIC OPPORTUNITY IN THE FUTURE

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Apis dorsata (Hymenoptera : Apidae), called giant honeybees, are important for energy consumption and supplemental income of rural communities in Indonesia. Certain technique is used On Belitung island, named *sunggau* as an artificial branch.

When its research was under taken in August to November of 1998 on Belitung Island, it was found a better understanding about sunggau management for honey production, nutritional resources, and a migration of *dorsata* population. Some visits after the research have showed (year of 1999, 2000, 2001) that visitors got the good impression of it. They said that it was very interesting attraction in the new perspective of the knowledge. In the congress of the Assian Apicultural Association (year of 2000), Attendants called the lost information from the wisdom of the local people.

From the view of economic building based on the natural resource, some wonder come up from the people that enlarging of oil plantation area, tin mining, coal exploration, sand exploration reduced the site and forest trees as an habitat and forages. If it is a small contribution from its heritage to the economic aspect, it will be disappeared as soon. It will affect through the live chain, the bee colonies are scarce, the pollination is reduced, plants diversity declines, related animal diversity and their populations will be reduced. It means unbalance ecosystem. Some problems will be attended soon.

We can introduce this local knowledge through the world in the ecotourism perspective than people can get the generate income from its activity. Thus it can be promoted to protect the degradation of the environment and the wisdom heritage. It can be promoted also to the scientists to explore its knowledge and will be followed by their colleagues visit.

INTRODUCTION

Apis dorsata is well known as the giant bees that always hang on the high branch of tall trees it can be as high as 50 m. People called honey hunter usually take the honey with climbing it. It is risky and only small number of people can do it. Some accident reported as falling down. On Belitung Island (Sumatra, Indonesia), collecting the honey can easily be taken due to a different method raising the bees. It is used an artificial branch which is usually placed in the secondary forest, 1.5 m above the ground, supported 2 poles ($\varnothing \pm 10$ cm, a length of 3 – 4 m). Some areas that have similar method are Vietnam, Central Sulawesi (Poso), West Kalimantan (Sentarum Lake). They are same in the philosophy of technique but different in the detail activity. No exchanged information has been made, but it could be any correlation of the societies.

DOCUMENTATION OF THE LOCAL KNOWLEDGE

From the field research, it was found that the people took the knowledge as the heritage from their families. It is assumed as about more than one hundred years. The main purpose to have the sunggau is to take the bees wax to be sold to the sailors and the honey as their consumption. No exact meaning for the sunggau.

Site construction

Site construction consists of construction of the sunggau itself and the space under it. The sunggau in general consists of one main trunk and two straight branching poles. Two different kinds of sunggau are known, classified according to their construction and form.

The construction is described as climbing sunggau and ground sunggau. The climbing sunggau is constructed on living trees that people have to climb the tree when they place it. The ground sunggau is constructed on the ground that The branchy poles support the sunggau trunk.

The form is described as gaping sunggau, fore-pole sunggau. The gaping sunggau is constructed using the standing trunk without a forepole. It is wide open in the upward position. The fore-pole sunggau is constructed by using the standing trunk with two branchy poles in the front and in the back.

Site selection

Not every place is suitable as a sunggau site. The people stated that the right site must have a landing area or road or mouth so the bees can get into the sunggau. It is present because of a natural or human impact. It was formed a gap structure due to the growth of vegetation, forest fire, natural devastation, impact of cutting trees. It is not established over a longer period of time. The growth of trees can change the site any time and human activities can change it all of a sudden. It can be differentiated into form like of Sea, Tunnel, Rabas, Lake.

Controlling

The controlling is done while the flowers start to bloom. They live on behalf of the forest and know when blooming season starts by the smell of the flowers. It happens from time to time though, that the colonies are already nesting even before the blooming season starts. Honey collectors either take time off their work to inspect their sunggau or do so when they are on their way to their pepper fields. If anybody sees a sunggau that is already occupied by bees and that belongs to somebody else, they will inform the owners. During the blooming period they take the whole day to inspect their sunggaus.

Harvesting

When they find bees in their sunggau, they will wait until the flowers are wilted. This will take about 1 – 2 weeks (sometimes up to a 1 month). At this point they prepare to harvest the honey. They use a smoker which consists of a group of dried small branches that are tied together and covered by fresh branches with leaves. They start by smoking their bodies and later smoking the colony. When they get close to the colonies with the smoke, the bees fly around and become gentle. This takes about 3 – 5 minutes. The harvesters cut off part of the nest, all of the brood comb and pollen comb is removed and put into a basket. The comb that is left is the honeycomb positioned on the topside. They now remove this

part of the comb and put it into the containers. This procedure takes another 5 – 10 minutes. The pollen comb is often thrown away. The honey will be pressed using the naked hand, filled into the container, tapped and stored. The waste comb will be kept to make wax by melting it in a watery hot jar.

RESULT FINDING

SUNGGAU

The areas

Only a small portion of the *Apis dorsata* population, managed by using the sunggau technique, is present in the Belitung area. The sunggau constructed close to the ground, it can be assumed that no honey bears lived in the area. They are reported to be the main enemy for *A. dorsata* (de Vries, 1992). Honey bears are not present in Belitung. Another reason for this kind of construction is the vegetation structure. This kind of sunggau was used in secondary forests where the vegetation is low. Secondary forests surround the villages in Belitung. *Dorsata* areas are normally located in places with high vegetation, the bee trees can be up to more than 50 m (Ruttner, 1988).

Nesting site

The sunggau was actually adapted from the natural nesting site. Some authors cited in Tan (1997) reported that they documented the characteristic of natural nesting site for *A. dorsata*. The following characteristics are similar for the sunggau and natural nesting site such as the angle of construction, the look of the branch, the way the comb hangs, the amount of light, the position of the branch to the open sky. These characteristics were adapted and described as “the slope position” (referring to the comb’s position on the branch), “the landing mark” (referring to the superior position of the branch to the open sky) (Tan et al., 1997, Crane et al., 1993) and “the small cavity inside” (referring to the light requirement) (Ruttner, 1988)

Ecological constraints

Due to land clearing for human needs or other objectives, the bee sites or beeforage areas are being reduced. The palm oil estates are mainly responsible for clearing these sites. They can clear thousands of hectares at one time, and are allocated 22,000 ha today. The exploitation of kaolin, sand, and tin is another factor. Activities concerning the forest utilisation are mainly shifting cultivation and logging. In terms of nature conservation, all of the mentioned factors have a high impact on honey production. For the case of the palm oil plantation area, many beeforage areas have disappeared and so do many comfortable sunggau sites. The same thing happened with the exploitation of sand material as seen in some part of Belitung, contributing to a delineation of the area for bee sites and beeforges.

HONEY COLLECTOR

Why do people make the sunggau

Sunggau management is a beekeeping technique like others in bee management, used for beekeeping with *Apis mellifera* in the past. The development was similar for the *dorsata* colonies in the past and today. Nesting sites (beetrees) and beeforges, mainly forest trees became scarce; natural nestings were replaced by keeping the bees on artificial nesting sites such as the sunggau in Belitung. It can be said that the sunggau is a kind of development of beekeeping management for the *dorsata* colonies.

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People mainly want the sunggau for economic reasons. It will not be necessary to climb trees to get the honey. Climbing needs certain skills and is risky.

Profile of Honey collectors

Productive activities of the honey collectors vary with their ages and other activities. They are teens to the 70's years old. They live in rural areas. Their main occupation varies as farmers, fisherman, work in tin mining.

Collecting honey has a long tradition, knowledge is passed from one generation to the other. Honey collectors have improved their skill by practising. Only some of them have sufficient knowledge and then they are called masters of honey collecting. The learning process is usually started at an early age at about 10 years old. They are well skilled by the time they reach their 20's and will be able to establish themselves with about 30 years.

POPULATION OF THE BEES

Distinct population

Comparing the two different of populations from Muara Enim, Sumatra and Tanjungrusa, Belitung, we found that they are considered distinct. They are located 370 km apart. It is still possible for the bees to leave Belitung to visit Bangka and Sumatra or vice versa. But it is quite impressive that width and length of the forewing are smaller for the Belitung population. This is also true for the cubital veins. These differences are probably caused by the co-adaptation process. There is no need for a long distance flight on Belitung, so their wings are smaller. Sumatra colonies need to fly long distances to reach their forages, so their wings are bigger. More population have to be compared to get a confidential conclusion.

Effect of sunggau on the populations

The organising management of beekeeping with the sunggau basically deals with constructing a comfortable nesting site for *A. dorsata*. People use the sunggau due to a lack of beetroes in the available beeforage areas. The sunggau gives an opportunity to the bees to reproduce and thus enlarge their populations. Obviously beekeepers destroy combs to take the honey. This reduces the bees in the colony, but they still reproduce and a new generation is born. Tan (1997) reported that bees reproduced in rafters by producing queen, this can lead to the conclusion that sunggau management supports the sustainability of the colonies.

Effect of declining populations on people

Honey production has decreased for the last 10 years, the *dorsata* population has declined. This negatively affects the villager's and the trader's income. Fewer people can live on honey production today. People suffer economically. And, as a nutritional food source, it is a great loss for the rural people and other consumers. Verma (1989) reported that bee products could help in overcoming the problems of malnutrition and health in rural areas.

Main pollinator of natural and agricultural flora

Information on the position of the *dorsata* bees in the global environment, particularly in Belitung is still scarce. It was reported that the honeybees contribute to the pollination in plantations. Verma (1992) reported that the honeybees are the most efficient pollinators for several cultivated and wild plants.

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Acting as pollinators, *A. dorsata* has certain advantages over other bees. They are available for nocturnal flight (Dyer, 1984), which contributes to the pollination of certain plants (Vohrwohl, 1999, personal communication). Pollinated trees are strongly affected due to the failed seed reproduction. Natural regeneration is delayed and their sustainability destroyed. This will lead to further consequences on the macro habitat. The environment will greatly change in the future, if the *dorsata* colonies disappear.

PERSPECTIVES FOR FUTURE

Some visits to the object have been made by author and colleagues consecutively in the year of 1999, 2000, and 2001. Stranger get a good impression about it. But the number of skilled people and the number of snigger declined. It is common today that young educated people do not know about their traditions of the sunggau management. Many people are not aware of this problem.

Further research is needed to find out more about how important the bees are to their habitat i.e. their contribution to pollination of the plants, what kind of plants are pollinated by bees, what is caused by decreasing bee pollination etc. The sunggau management needs to be further documented with more elaborating on the biology of *Apis dorsata* and further improvement. It is also important to qualify the contribution of sunggau management for the *dorsata* population. Furthermore, the migration behaviour of the bees must be documented and decisions have to be made and implemented to improve the sunggau management and the existence *dorsata* populations.

The challenge in keeping of the local knowledge can be made in perspective of ecology and the societies. People have to be aware about their proper knowledge and their live. It is necessary to make Outsourcing education through the local people. For the promotion of the local knowledge, it can be arranged in a package of ecotourism. They can take the income from their knowledge and assist for global need to preserve the environment.

CONCLUSION

The sunggau is part of kind the local knowledge from the Belitung societies that can be shared to other people in perspective of preservation of the ecology, empowerment of local people, increased the domestic income. It can be in the package of ecotourism that can be extended for the exchange of the other knowledge from visitors.

REFERENCE

- Chinch, Pung Huu, P.H. Thai, N.Q. Tan, N. H. Minh and N.Q. Tan . 1995. Raftering, a tradisional technique for honey and wax production from *A. dorsata* in Vietnam. *Beekeeping and Development* 36: 8-9.
- Crane, Eva. 1990. *Bees and Beekeeping : Science, Practice and World Resourcer*. Heineman Professional Publishing Ltd. Haley Court, Jordan Hill, Oxford OX28EJ.
- Crane, Eva. Vu Van Luyen, Mulder, Tran C. T. 1993. Traditional Management System for *A. dorsata* in submerged forests in Southern Vietnam and Central Kalimantan. *Beeworld* 74 (1993), p. 27-40.

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- DeVries, R. 1990. The history of honey and wax production of the giant honey bee (*A. dorsata*) in Sumatra and Kalimantan, Indonesia. Proceeding of the first Nectar Seminar. P. 75-85. Amsterdam.
- Gries, M., N. Koeniger, G. Koeniger, S. Tingek, A. Kelitu. 1998. Different mating strategies among asian honeybee drones. In the proceeding of the XIII International Congress of IUSSI. Adelaide, Australia.
- Koeniger, N. and G. Koeniger. 1980. Observations and experiments on migration and dance communication of *A. dorsata* in Srilanka. J. Apic. Res. 19 (1):21-34.
- Koeniger, N. and G. Koeniger. 1999. Foraging of *A. dorsata* in the moon light, observation in Sabah (personal communication).
- Koeniger, N., G. Koeniger. S. Tingek. A. Kelitu. M. Mardan. 1994. Drones of *A. dorsata* F. Congregate under the canopy of tall emergent trees in Borneo. Apidologie 25 (1994), p. 249-264.