Local Knowledge of Beekeeping Activity in Bonto Karaeng Village, Sinoa Subdistrict, Bantaeng Regency

A S Mahbub\textsuperscript{1}, Makkarennu\textsuperscript{1}, A R Y Wijayanti\textsuperscript{1}

\textsuperscript{1} Forest Policy and Entrepreneurship Laboratory, Faculty of Forestry, Hasanuddin University

E-mail: asarsaidmahbub@gmail.com

Abstract Local knowledge is an essential knowledge which comes from daily experience which is developed hereditarily and is believed by society. This research aims to identify the local expertise of beekeeping activity which is applied by society in Bonto Karaeng Village. This research was conducted in May until December 2016 at Bonto Karaeng Village, Sinoa Subdistrict, Bantaeng Regency. The population of this research is the society around the village forest. The sample drawing uses snowball sampling. Data were analyzed by using a qualitative method by analyzing the data of interview and field observation that bring local knowledge to society in bee activity. The result showed that the local knowledge applied by society in beekeeping activity at Bonto Karaeng Village that is the knowledge of beekeeping management, the harvesting and post-harvest, the health benefit of beekeeping, and local reliance.

1. Introduction
Local knowledge is the knowledge that comes from traditions or experiences that are developed and preserved and hereditary trusted by the community. Local knowledge has existed in people's lives from ancient times until now that is built naturally in the community then developed into a culture [1,2].

Beekeeping is one of the most important ways of handling local knowledge, handling and processing. This activity then generates lots of local knowledge through various innovations. Some studies show various forms of local knowledge developed by the community. Study shows that there is local knowledge ranging from climate determination, fishing, colony management to harvesting and marketing [3].

One characteristic of local beekeeping knowledge in this village forest area is its oral delivery with transgenerational inheritance. The results of a study in Labbo Village, Tompobulu Subdistrict, Bantaeng District showed that the local knowledge of the community in beekeeping contributed to the enrichment of beekeeping knowledge because it was important to study and leverage this local knowledge elsewhere [3].

This research on local storage is focused on Bonto Karaeng Village because of the village forest in Bonto Karaeng Village. Based on the results of a diagnostic study, some communities have sought beekeeping activities ranging from forest bee hunting to traditional honey bee cultivation.
2. Methods

This research was conducted in May of December 2016. The research took place at Bonto Karaeng Village, Sinoa District, Bantaeng Regency, South Sulawesi Province. Data collection methods were carried out by conducting field observation interviews (interview guidelines and triangulation approach), literature study and documentation to produce two types of data namely primary and secondary data. The primary data needed include public knowledge about beekeeping from the management of beekeeping, harvesting, and post-harvest, as well as the benefits of honey, the information of which is obtained from people who have passed down hereditary activities for generations. Secondary data is data that has been collected and then analyzed qualitatively includes 3 stages: data reduction, data presentation, and conclusion drawing.

3. Result and Discussions

Beekeeping local knowledge in Bonto Karaeng Village is a form of knowledge through the process of understanding and interpreting observations and experiences used in beekeeping activities. Local knowledge is also based on the transgenerational inheritance process; the community considers that the knowledge they have is still by the conditions that exist in their environment, then what they understand is conveyed or communicated so that ultimately local knowledge about beekeeping persists to this day.

The results of the study show that in general the local knowledge of the community in the beekeeping activities is divided into 4 parts, i.e. knowledge of beekeeping management, knowledge of harvesting and post-harvest, knowledge of the benefits of beekeeping to health, and knowledge of local beliefs.

3.1. Knowledge of Beekeeping Management

Knowledge of beekeeping management is a series of activities that have several elements, ranging from determining the entry of beekeeping activities, colony capture, site selection, protection from stings, and protection of colonies from pests and diseases. Descriptions of local knowledge that play a role in beekeeping management knowledge are described as follows:

Knowledge of climate and natural symptoms

Climate is one of the factors that are very important for the life of bees because beekeeping activities begin by paying attention to natural signs to determine the season. One of the community knowledge used in determining the markers of the season is coffee plants. If the rainy season comes, the coffee flower is abundant and blows.

Climate influences begin to appear since the primary branches are approaching flowering. Much or the duration of irradiation is a stimulant for the size of flower preparation. The dry season is the season for preparing flowers for coffee plants, and the flowers will bloom when they are at the end of the dry season to the rainy season [2].

In addition to climate signs, when entering the beekeeping season, people also pay attention to the Islamic calendar (Hijri). In the Islamic calendar (Hijri) the rainy season starts when the young month is the month of Muharram. The beginning of the month, which is 1-15, usually rains in the morning so that the bees are lazy to look for food. On the 15th the rain fell on average in the afternoon so that the bees had time to find food in the morning.

Knowledge of how to capture colonies

Colony capture is the initial activity in honey bee cultivation. Usually, people catch colonies that nest around their homes. Determining the location of the honeycomb is a particular skill that the community has, they determine the location of the nest from several indicators.

The signs used as guidelines are: observing the place of bees flying if there is a crowd of bees means the area of nesting is not far from the crowd. After that, the community observed bee droppings on the ground surface. If a lot of bee droppings are scattered on the ground, the nest is around it. Bee droppings usually consist of large amounts of dirt and have a small tail. Where does this little dirt lead, then where is the bee nesting.
People assume that bees come out in the morning by removing dirt to ease the burden so they can fly quickly while leaving the nest. The behavior of removing dirt and the form of bee droppings is similar to lizards, there is a large amount of dust, and some are small. The next observation is the speed of flying bees in the morning. If the bee flies at high speed towards a certain direction, it means that the location of the nest is the opposite, so also if the community finds the bee flying at low speed while swerving means the bee goes to its nest.

One of the tools commonly used by people when hunting bees in the forest or catching colonies is the confinement of the queen. Bringing the queen's cage while searching for colonies is a technique that is considered effective by the public to get colonies. After the colony gathered in Bandala (stup), it was immediately closed and brought home.

Knowledge of site selection
The exact location determines the success of the bees that will nest. People in the village of Bonto Karaeng generally maintain bees at the location of rocks and lappara (land that has flat topography).

The community widely applied beehives arranged from rocks (commonly called stone nests). They placed these stone nests on cliffs on the edge of the embankment. These stones are arranged in such a way as to form a semicircular space on the inside which is estimated to be able to accommodate the area of the nest built later by bees. Placement of this stone nest is attempted to face the rising sun, the reason if the morning sun can stimulate the bees to look for food immediately actively, but during the sunny day, the stone nest will be protected by the embankment so as not to make the temperature inside the stone nest too hot. Besides that, the stone nest is placed in a location with lots of flowering vegetation which makes it easy for bees to collect food.

Another area commonly used as a place to make nesting bees is Lappara. Lappara is a land that has a flat topography. The lap part area makes it easy for people to monitor the colony because of its flat and open location. Bees prefer a flat place because the location uphill from the foraging location will make it difficult for bees because of the earth's attraction.

Knowledge of how to protect from the sting
Bee stings cause allergies with symptoms of pain, swelling, and redness around the sting. Bees sting if they feel disturbed and in danger. People have their ways to protect themselves from bee stings Kapri bean leaves are a type of plant that is considered good by the community to deal with pain when stung by bees. Peas contain anti-inflammatory compounds that can cure pain nuts are also good for consumption can cure asthma and inflammation of the joints or called uric acid. Also, ordinary people use land under rocky nests.

Knowledge of the protection of colonies from pests and diseases
Pests in bees are all disturbing organisms that can be economically detrimental. While conditions of bees are the factors that cause disturbances in bees that come from microorganisms such as viruses and bacteria. Pests and diseases can cause bee productivity to decrease. Therefore, it is necessary to take action to control it. Several ways are carried out by the community to control pests and bees.

The presence of ants, cockroaches, lizards, and others is considered very disturbing and detrimental to production because the insects eat honey, wax, and flower pollen (bee pollen). Interference can be controlled using used oil. A simple way to control a nuisance organism is to place a support leg of a nest chest in a can that contains used oil [4].

If control measures are unsuccessful, the community exterminates pests by capturing pests and destroying them or separating nests from pests or diseases and burning them to prevent further attacks. This control is called mechanical control.

3.2. Knowledge of Harvesting and Post-harvest
Harvesting is an activity of taking honey from its nest, a series of harvesting activities are needed. Harvesting honey is usually done during the dry season until before the rainy season because at that time
honey feed is abundant. The community sees that the availability of honey in the nest is abundant and is ready to be harvested by looking at the signs in the nest and the surrounding environment. The process of harvesting by fumigation is done to expel the bees from the nest by using artificial smoke from several bamboo blades or using egg shelves, other than that tools such as knives and storage containers also need to be prepared.

Smoke and rising temperatures can interfere with the bee colonies, so the colonies will leave their nest to move to safer places. Smogging is a safe way for the survival of the colony because the bees and their nests are far from the possibility of being exposed to coals of fire [5]. The smoke does not make the bees aggressive, but only flies away from the nest. The nests that have been left by the occupants can be cut immediately to get the honey.

After harvesting honey, the next stage is post-harvest. Extraction of honey is something that is done in post-harvest. The community extracts honey by squeezing directly which is squeezing each piece of nest then filtered to remove honey from its nest.

People extract honey from a nest using their hands or cloth, the honey produced is not too clear because pollen usually gets caught. A good way to extract traditional honey is by draining it. It is better to let honey leave itself from the nest [4]. For this reason, the honeycomb must first cut the cell lid first, then do two incisions that cut both sides of the nest right at the bottom of the cell, because the honeycomb cells open both ends, so the air pressure will cause honey to flow out of each cell. Honey obtained is better and better in quality than honey produced.

3.3. Knowledge of the Benefits of beekeeping to health
Honey is a sweet liquid derived from plant nectar which is processed by bees, since long ago until now honey is known as food or natural drink has an important role in human life. Benefits that are known by the community include honey can be used to relieve fatigue and fatigue and help speed up drying and heal wounds. Also, some infectious diseases can be cured and inhibited by consuming honey regularly, including a cough, fever, heart disease, lung, respiratory infections.

3.4. Knowledge of Local beliefs
There are some things that are still trusted by the community about something that should not be done. If this is done, the community believes it will cause consequences because it has violated the precepts that have been believed for generations.

The beliefs that are forbidden to disturb and take the nest does not belong; when someone who takes the nest does not belong, it will be affected by diseases such as itching or allergies.

4. Conclusion
Based on the results of research in the village of Bonto Karaeng there is some local knowledge used by the community in beekeeping activities, namely beekeeping management, harvest handling and post-harvest, the benefits of beekeeping to local health and beliefs.

To maintain the quality of honey produced, there needs to be government involvement to provide understanding in the form of training both on local honey packaging and marketing techniques, so that local honey is maintained and will later increase the income of the people in Bonto Karaeng village.

Local knowledge can be lost and extinct. Therefore it is necessary to preserve local knowledge by conducting documentation such as making local knowledge so that it is easily accessible in the form of reports, books, or other media.

References
[1] Aak 1988 Budidaya Tanaman Kopi (Yogyakarta: Kansinus) p 34-40
[2] Duangta, K., Borisutdhi, Y., & Simaraks, S 2018 Knowledge management of pomelo production system in northeast Thailand case study of the pomelo farmer group in Ban Thaen district Forest and Society 2 162-172.
[3] Baharuddin 2012 Kearifan Lokal Pengetahuan Lokal dan Degradasi Lingkungan (Jakarta: Universitas Esa Unggul Press) p 5-7
[4] Sihombing 2016 Ilmu Ternak Lebah Madu (Yogyakarta: Gajah Mada University Press) p 8-10
[5] Hadisoesil S 2007 Kearifan tradisional dalam “budidaya” lebah hutan (Apis dorsata) (Jakarta,: Badan Penelitian dan Pengembangan Kehutanan) p 98-9