Community perception and utilization of raru in Bonalumban Village

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Abstract. Village life around the forest is inseparable from the existence of the forest. The use of raru as a forest product has been passed down from generation to generation in the community of Bonalumban Village, Tukka District, Central Tapanuli Regency, North Sumatra. The study of community perceptions and dependencies on Raru in Bonalumban village is needed to determine the potential of raru and encourage efforts to preserve raru. The method of selecting respondents is done by purposive sampling by selecting general respondents and specialized respondents. Data analysis uses descriptive statistics. Public perceptions about the existence of raru in nature are still plentiful so there is no public effort to regenerate. Community dependency on raru is grouped into four categories, that is for sale, palm wine concoctions, animal cages, and building materials. Raru harvesting activities by felling without being accompanied by cultivation activities causes the presence of raru vegetation to decrease.

1. Introduction
Indonesia has a tropical forest area of 126.8 million hectares and the third largest in the world after Brazil and Congo, which is very rich in biodiversity and can be estimated to have more than 25,000 types of flora [1]. The abundant flora and fauna species have not been fully utilized, moreover there are lesser known species, one of which is the raru plant (Cotylelobium melanoxylon).

For most Batak people, some parts of the raru are used for traditional medicine. As part of the bark and leaves of plants are used to treat various diseases such as diarrhea, malaria, and diabetes [2]. The results [3] also found that the bark of raru contains compounds consisting of ampelopsin F, isoampelopsin F, -viniferin, vaticanol A, E, G, and lyoniresinol which are useful as anti-diabetic drugs. For the people of North Sumatra, the existence of raru is also related to the production of palm wine. According to [4] raru skin is used as a mixture in tuak drinks which serves to reduce the foam of tuak and improve the taste.
According to [5], the raru is categorized as an Endangered species, but in 2019 the raru underwent a status change to Least concern. This shows that the presence of the raru population is increasing. However, this is contrary to the presence of raru in Bonalumban Village, Tukka District, Central Tapanuli Regency, North Sumatra which is a natural distribution of raru. The harvesting of bark by debarking and illegal extraction of wood without the ability to regenerate causes the potential of this species to decrease drastically. Conversion of land for oil palm plantations has also caused the rare population to be on the verge of extinction.

The role of the community in maintaining the existence of a species is very important, one of the community's efforts that can be done is through local wisdom. Raru is no exception. As a potential species, the existence of raru in nature is under quite heavy pressure. The use of raru cannot be separated from the role of the community. The community's perception of the use of raru and how important it is for their lives is not yet known. However, there is no data that answers about the perception of the community, especially the surrounding community in Central Tapanuli which is the habitat of the raru distribution. Therefore, it is necessary to conduct research on public perception and the use of raru.

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2. Materials and Methods

2.1. Field of Study

This research was conducted in the forest area of Bonalumban Village, Central Tapanuli, North Sumatera.

2.2. Determination of Respondents

The number of respondents who were sampled in this study, as many as 80 people with a scope of age 17 years and over and were taken randomly in the village of Bonalumban, this is in accordance with the statement [6] the number of respondents who were sampled, namely if the number of respondents <100 heads of families, then all the respondents were taken. respondents. While the number of respondents> 100 heads of families, then 10-15% of the total heads of families are taken.

Respondents were divided into 2 parts, namely general respondents and key respondents.

a. The general respondents in this study were people around the natural forest of Bonalumban Village, Tukka District, Central Tapanuli Regency, North Sumatra, who knew about the raru tree and used it directly.

b. Key respondents were village heads, tribal chiefs, religious shops and other community leaders. Determination of key respondents is done using purposive sampling method that is adapted to the research objectives [7] through interviews and questionnaires directly to the community.

3. Results and Discussion

3.1. Community Social Condition

The results showed that the level of education in the village of Bonalumban, is still very low. This is known from the majority of education obtained by the community. Table 1 shows that the percentage of people who received education above Junior High School was much lower than the people who received education up to Elementary School and Junior High School.

Communities around the forest generally interact directly and utilize forest resources. The Bonalumban Village community is no exception, who use raru as a livelihood. This is due to the low level of community knowledge about developing other potentials as livelihoods and improving the family economy. According to [8], the high level of interaction between forest communities and the forest is due to the low level of community income, low education level, narrow land ownership, and the rapid rate of population growth. The tabulation of the education level of the respondents in the community of Bonalumban Village is presented in Table 1.

| Level of Education | Percentage |
|--------------------|------------|
| Junior High School | 20%        |
| Secondary School   | 30%        |
| Tertiary School    | 50%        |
1. Around 52.5% of the respondents only had education up to elementary and junior high school levels, and 2.5% did not attend school. These conditions make people live dependent on nature as farmers and fishermen. According to [9], the condition of low public education affects the mindset of the community, has an impact on creativity in finding sources of livelihood.

The people who make raru their livelihood are 35 respondents (44%), while the people who do not use raru are 45 respondents (56%) (data not shown). Most people only use raru as a side job and there are even people who do not use raru at all. This is because some people think that depending on raru will not make their lives develop because the price of raru is relatively cheap, which is only Rp. 10,000,- / bunch, less varied utilization, as well as the raru population that continues to decline. According to [10], the community's dependence on the forest at the level of the value of the use of forest products is still very small when compared to the value obtained by the community as a whole which is not derived from the value of the use of forest products. In this case, the utilization of forest products is not the community's main job but a side job.

3.2. Community Perception of Raru Utilization in Forest Areas

The community's perception of the raru population in natural forests can be a reference in efforts to conserve raru. Table 2 shows the assessment of the presence of raru by the community in Bonalumban Village.

**Table 1. Tabulation of respondents' education level**

| No | Level of education | Number of Respondents (Persons) | Percentage (%) |
|----|--------------------|---------------------------------|----------------|
| 1  | Elementary school  | 6                               | 7.5%           |
| 2  | Junior High School | 36                              | 45%            |
| 3  | Senior High School | 29                              | 36.25%         |
| 4  | University         | 7                               | 8.75%          |
| 5  | No formal education| 2                               | 2.5%           |
| TOTAL|                    | 80                              | 100%           |

**Table 2. The Bonalumban Village Community's Perception of the Existence of Raru**

| No | Raru's Presence | People's opinion |
|----|-----------------|------------------|
| 1  | Very reduced    | 16               |
| 2  | Reduce          | 28               |
| 3  | Ordinary        | 25               |
| 4  | Still many      | 31               |

Most of the people in Bonalumban Village have the opinion that the presence of raru is not reduced or normal (25%) and is still abundant (31%). Based on research [11], the presence of raru at the tree level was abundant, indicated by the highest INP (rank 1), but the presence of raru at the growth rate of seedlings and saplings in Bonalumban Village showed a low density level compared to the level of poles and trees. This indicates that there is a problem with natural regeneration and will have an effect on the low survival rate of poles and trees in the future. The public perception that says raru is decreasing, can encourage conservation and planting efforts through socialization provided to the community.

Raru harvesting that continues without being followed by cultivation and replanting efforts has reduced the number of raru in the natural forest of Bonalumban. From the interviews, most of the community did not know about the prohibition of excessive harvesting of raru in the natural forest of Bonalumban. With the community's understanding of the importance of preserving raru in the natural forest of Bonalumban, it can be one aspect that supports the preservation of raru. The participation of the community around the forest is a very important thing to improve to support efforts to conserve a species.
3.3. Utilization of Raru

In Bonalumban Village, 2 (two) types of raru were found, namely raru dahanon and raru songal. Raru Dahanon is the most popular raru by the local community. This is because raru dahanon provides a more delicious taste and good color (clean white). The word "dahanon" comes from the Batak language which means rice, according to the skin of raru dahanon which is pure white like rice. Raru songal has red, hard and bumpy skin so people don't use the skin of raru songal as a mixture of tuak drinks. In addition to the difficult harvesting process due to the hard skin, raru songal also does not provide a delicious taste and can darken the color of tuak. The community is more dominant in using the raru songal tree trunk as a building construction material, like a truck, and livestock cages. The use of raru by the people of Bonalumban Village is presented in table 3.

| No | Utilization Type          | Utilization percent |
|----|---------------------------|---------------------|
| 1  | For sale (wood and leather) | 5                   |
| 2  | Tuak herb                 | 75                  |
| 3  | Animal cage               | 11                  |
| 4  | Building material         | 5                   |
| 5  | Not taking advantage of   | 4                   |

According to [12], knowledge of ethnobotany is found in many traditional tribes in Indonesia which is the result of interacting, processing, and using forest plants. There is an interaction between the Bonalumban village community and the raru plants namely, for sale, palm wine, animal cages, and building materials. The results of the research in Bonalumban Village showed that most of the people (75%) used raru as a mixture for the manufacture of traditional alcoholic beverages "tuak". The shape and color of the raru dahanon skin is presented in Figure 1.

![Figure 1. Harvesting raru dahanon skin to be used as a mixture of tuak drinks](image)

According to [4], raru peel is used as a mixture in tuak drinks which serves to reduce the foam of tuak and increase the taste and alcohol content. According to [13], raru is a forest wood plant whose trunk has long been used by the Tapanuli community as a building material. Over time, the bark of raru was used as an additive to a drink known as tuak and recently the boiled water of the leaves is believed to be able to treat wounds by washing wounds, and the bark of the stem is believed to be an antidiabetic drug. The shape of the raru dahanon stem used as a building material is presented in Figure 2.
According to one respondent who is 70 years old, the use of raru has been trusted for generations as an antidiabetic drug until now. So that some people consume a decoction of the skin or leaves of raru and palm wine with a mixture of raru skin in the hope of curing the diabetes they suffer from. The results of the study [3] stated that the bark of raru stems contains compounds consisting of ampelopsin F, isoampelopsin F, -viniferin, vaticanol A, E, G, and lyoniresinol which are useful as anti-diabetic drugs.

4. Conclusion
Found 2 (two) types of raru in Bonalumban Village, namely raru Dahanon and raru Songal. People only use raru dahanon skin as a mixture of tuak drinks. Meanwhile, raru songal is used by the community as a building material or tool. Raru leaves are used by the community as medicine because it is believed to cure diabetes.

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