International Journal of Design & Nature and Ecodynamics
Vol. 19, No. 1, February, 2024, pp. 69-80
Journal homepage: http://iieta.org/journals/ijdne

Correlation Status of Cultural Significance Index to Characteristics of Krui Indigenous People as a Base for *Repong Damar* Conservation Efforts

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https://doi.org/10.18280/ijdne.190109

Received: 21 October 2023
Revised: 24 November 2023
Accepted: 4 December 2023
Available online: 29 February 2024

Keywords:
forest conservation, cultural values, ethnobotany, Index of Cultural Significance, Krui indigenous people, Lampung tribe

ABSTRACT

One of the provinces in Indonesia that has local wisdom in forest management is Lampung Province, specifically in Pesisir Barat District. Lampung Province is dominated by indigenous Lampung tribes. The local wisdom they practice is related to the knowledge and utilization of vegetation around the *Repong Damar*. This study aims to examine vegetation conservation efforts based on cultural values in relation to the cultural characteristics of Lampung tribal communities. The research approach uses quantitative methods and data collection based on snowball sampling techniques. Data analysis used included: Index of Cultural Significance (ICS) formula in analyzing the importance of vegetation; and Spearman Rank in analyzing the correlation of indigenous characteristics to ICS. The study showed that of the 29 species found, ginger (*Zingiber officinale* Rosc.) is the vegetation that has the highest ICS value of 42. The *Shorea javanica* has ICS value as 22.5 while the species of *jengkol* (*Archidendron pauciflorum* Benth.), *kabau* (*Archidendron bubalinum* Jack.), *bayur* (*Pterospermum javanicum* Jungh.), pepper (*Piper nigrum* L.), suren (*Toona sureni* Merr.), taro (*Colocasia esculenta* Schott.), mangosteen (*Garcinia mangostana* L.), *melinjo* (*Gnetum gnemon* L.), jackfruit (*Artocarpus heterophyllus* Lam.), *petai* (*Parkia speciosa* Hassk.), *tupak/kemundung* (*Baccaurea racemosa* Muell.), and coffee (*Coffea* sp.) have the lowest ICS, the each value is 4. The ICS shows that indigenous people mostly used ginger as medicinal plants in their daily lives. Age (> 45 years) and duration of stay (indigenous people) have a positive correlation to ICS, while education level, age (< 45 years), education and duration of stay (migrants) have a negative correlation to ICS. Based on the results of this analysis, education has no correlation to ICS therefore the younger generation (< 45 years) and migrants need various extension education and or various training to increase skills in managing the Krui damar forest because their condition has a negative correlation with the cultural index.

1. INTRODUCTION

Ethnic diversity in Indonesia is very high, more than 300 ethnic groups or tribes, to be precise according to Walujo's study [1] and data from the Central Statistics Agency (2010) there are 1,340 ethnic groups, each of which has a unique local wisdom. One of these tribes is the Krui indigenous people. The Krui people are indigenous people who live in the Krui area, Pesisir Barat Regency, Lampung Province. They have local wisdom in various aspects of life such as traditional forest management based on their ecological knowledge. In addition, the Krui community is also active in various cultural and economic activities that show the enthusiasm and participation of the local community [2]. They also have local wisdom on the management and utilization of vegetation in the *Repong Damar* located around their village. *Repong Damar* is a term used by the Krui indigenous people to refer to forests dominated by *Shorea javanica* species [3]. The *Repong Damar* (*Shorea javanica*) forest covers an area of approximately 29,000 hectares and is a state forest known as a Special Purpose Area (KDTI) based on Minister of Forestry Regulation No. 47 of 1998. This forest is also known as a forest that symbolizes the cultural identity of the Krui indigenous people. *Repong Damar* is in the form of mixed farmland and is managed with an agroforestry system. Representative research in Nepal shows that mixed forest management by communities can be effective in maintaining and expanding forest cover in community forest areas [4]. As well as state forests, there are also community forests in Pesisir Barat. The *Repong Damar*, used as the research site is a community forest and is the main source of family income. A study in rural Ethiopia also supports that community forests contribute to household livelihoods [5]. This suggests that community forests are an important source of income for households and contribute to participatory forest management. To fulfill daily needs, the utilization of vegetation that grows

in *Repong Damar* is still very high and is carried out traditionally in accordance with local culture and existing community characteristics [6]. The concept of local culture-based forest management is also found in the Bulang indigenous community in Yunnan Province, China, using their local knowledge to maintain forest sustainability and biodiversity [7]. In addition to resin, the research site also contains various flora and fauna. This is proven by various studies that found various types of flora in *Repong Damar* in Pesisir Tengah Subdistrict, Pesisir Barat Regency. *Repong Damar* stands can be seen in Figure 1.

Figure 1. *Shorea javanica* stands

In addition to fulfilling economic needs, resin also has an ecological function. Lensari and Yuningsih [8] stated that, ecologically, the development phase of Repong [6] found as many as 28 tree species consisting of seedlings, saplings, poles and trees with a tree species diversity index of 1.86 and categorized in moderate diversity. Fauna was also found by Firdaus et al. [9] in the form of 16 bird species from 10 families and 15 species from 7 families by Findua et al.'s study [10]. High vegetation diversity means *Repong Damar* can also function as a carbon storage agent. The results showed a total biomass of 249.72 tons/ha and carbon sequestration in *Shorea javanica* damar stands of 124.86 tons/ha [11]. Research by Bhaskara et al. [12] classified *Repong Damar* as a forest that has high carbon stocks, which range from 174.22 to 254.09 tons/ha so that it can be categorized as a forest with good conditions. CO_2 sequestration potential ranges from 639.37 to 932.52 tons/ha. The sustainability of various species of fauna and flora as well as the carbon contents of a forest, including *Repong Damar*, is influenced by the behavior and awareness of the surrounding community. This is like the case study of forest management in Dopolan, in which local community awareness is an important aspect of forest management in Dopolan [13]. Study by Matsvange et al. [14] also supports that giving community's control over resources in their area, which can be considered as common goods, gives them the responsibility to manage the use of those resources and rehabilitate environmentally degraded areas. Communities are motivated to conduct local initiatives to improve their environment.

Damar represents the stages of natural forest succession with all its ecological benefits. One example of the community's role in managing *Repong Damar* as a form of landslide mitigation is the guarding of the existence of a forbidden forest. The community believes that there is a part of the *Repong Damar* as a forbidden forest. This means that the community is not allowed to damage *Repong Damar* because it is believed that they will be miserable and get bad disasters [15]. According to *Peratin* (Village Head), this is also considered as one of the traditional cultural characteristics of Krui. Thus, it can be interpreted that the community has been managing the *Repong Damar* based on local traditions and culture. Regardless of these beliefs, the behavior and awareness of the community around *Repong Damar* in maintaining its sustainability is certainly higher and in accordance with local culture because they have a high dependence on forest products compared to people who live far from the forest. *Repong Damar* farmers in Penengahan Village have an average income from *Repong Damar* of Rp. 16,120,000/KK/year, income outside *Repong Damar* ranges from Rp. 4,200,000/KK/year to Rp. 24,000,000/KK/year and the average income per capita of the community in Penengahan Village is Rp. 5,169,200/person/year or Rp. 430,800/person/month [8]. Farmers' income is derived from the resin harvest (Figure 2).

Figure 2. The outcome of resin extraction

According to this fact, it is necessary to conduct a study on how people utilize vegetation in the *Repong Damar* based on their local culture. One alternative that can be used to determine the impact is through quantitative ethnobotanical studies focused on observing and analyzing the Index of Cultural Significance (ICS) of each type of vegetation useful for local communities. The analysis of cultural significance is based on the parameters of quality, intensity, and exclusivity of use of each vegetation type. The ICS value is an indication of the importance of each vegetation type for the community at the study site. This ICS data is important for the basis of

consideration of important and potential types for economic purposes and conservation of vegetation that needs to be conserved in a location including *Repong Damar* based on local socio-culture [16]. Traditional knowledge systems based on local socio-culture are very important in the context of vegetation resource conservation, utilization, and environmental management. It includes knowledge that needs to be recognized by the local communities, such as Figure 3, which shows the process of resin harvesting by the community.

Figure 3. The process of harvesting resin sap

The ICS analysis as part of ethnobotany which is a science to determine the utilization of vegetation based on scientific studies will certainly be very beneficial in maintaining and preserving biodiversity [17]. The existence of communities around the *Repong Damar* as a vegetation utilizer must support the ecological function of the *Repong Damar* based on their local wisdom. The ecological function of the damar forest that is maintained will certainly support economic and social functions because the production of forest products will be sustainable [18]. So far, studies on the ethnobotany of *Repong Damar* that are relevant to the culture of the Krui communities have not existed because so far research on *Repong Damar* is mostly about flora and fauna diversity [6, 9, 10, 19], its forest cultivation [20], inheritance of *Repong Damar* management rights [3] and about forest policy researched by Kolbinur and Hutagalung's study [21]. There has been no study that discusses the correlation of community characteristics with local cultural importance in supporting the sustainability of *Repong Damar* by using quantitative ethnobotany through the ICS formula. A number of studies that have been conducted qualitatively highlight the importance of local wisdom as an integral part of the culture of a community in managing natural resources. For example, study by Rohmadi and Akmal [22] in Sungai Duren Village, discusses the correlation between religion and the local culture of the community in managing their agricultural land. Moreover, there are also other studies that highlight the importance of local wisdom in the formation of people's character through their own culture-based education [23]. Considering these reasons, this study aims to analyze the correlation of ICS with age, length of time living, and education level, which are characteristics of the Krui indigenous community in supporting the conservation of *Repong Damar*. Besides being the main source of community income, the *Repong Damar* must be preserved because it has been designated as KDTI since 1998.

The management and utilization of Indonesia's forest resources, especially the *Repong Damar*, must be accompanied by the preservation and restoration of pre-existing ecosystem functions. So far, there has been a lot of research into forest sustainability through restoration efforts which has been linked to socio-economic factors, for example research by Wulandari et al. [24] in West Lampung and has not yet analyzed how it is correlated with local culture. Another example study of local wisdom-based environmental conservation is in Lubuk Beringin, which is a form of conservation based on customary law and Islamic law [25]. The study has proven that productive utilization of natural resources in the ecosystem and wise environmental conservation can establish a productive environment with sustainable local wisdom. It means local community participation is a key factor in sustainable development based on local wisdom [26], including in the management of customary forest such as *Repong Damar*. Therefore, local wisdom-based forest management can contribute to achieving the Sustainable Forest Management (SFM) by prioritizing sustainable development and environmental conservation. This study aims to examine the efforts to preserve *Repong Damar* based on cultural values (Index Cultural Significance, or ICS) and analyze its relationship to the characteristics of the Krui indigenous people.

2. MATERIALS AND METHODS

2.1 Study area

The research was conducted in the Krui indigenous community settlement in Pekon Pajar Bulan, Pesisir Tengah Sub-district, Pesisir Barat Regency, Lampung Province (Figure 4). The time of this research was in October-December 2022.

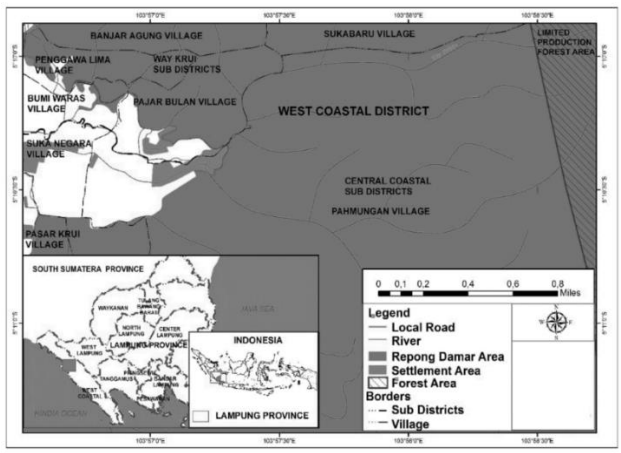

Figure 4. Research location map

One location of the *Repong Damar* is in Pekon Pajar Bulan, West Lampung District, and its forest grows as an agroforestry system [27, 28]. For generations, resin of *Shorea javanica* has been basis of a local Krui potential economic. This makes the *Repong Damar* have a value for the views and local knowledge of indigenous peoples in regulating traditional management systems [29]. *Repong Damar* is a form of forest management based on traditional agroforestry systems to maintain the social, economic, and ecological functions that have been carried out by indigenous Krui communities for hundreds of years [30].

People believe resin Repong is their best culture heritage

because it is important to support the life of their family [29]. The majority of *Repong Damar* forest product used by the Krui indigenous people is resin of *Shorea javanica* or *damar mata kucing* [28]. Actually, there are various other potential types of plants that can be utilized by the community, such as durian (*Durio zibethinus*), mangosteen (*Garcinia mangostana* Linn), melinjo (*Gnetum gnemon* L), cinnamon (*Cinnamomum verum*), rattan (*Calamus rotang*), cocoa (*Theobroma cacao* L.), and coconut (*Cocos nucifera* L.), but they don't utilize them optimally. This shows that the socio-cultural system of the Krui indigenous people has a great influence on generations who intensively manage their resin Damar plants compared to other plants [27]. Indigenous peoples believe in traditional values, culture, regulations, and sanctions on managing resin *Repong Damar* forests, and they also always strive to maintain the status and social position of the benefits of these forests for the community [31]. This is done through internal-socialization system within their family, therefore the knowledge and traditional practice of *Repong Damar* still exist in the Krui indigenous community [30].

2.2 Procedures

2.2.1 Sampling techniques and research instruments

The population in this study is the community that owns and manages *Repong Damar* as property. According to custom, there is only 14 families who managed the *Repong Damar* forest traditionally by themselves for a long time from generation to generation. The number of research respondents was 10 people, and this number was obtained based on the snowball sampling method used when collecting data and information from the community [32, 33]. The snowball sampling technique is a method for identifying, selecting, and taking samples in a network or a chain of interrelated relationships. According to studies by Naderifar et al. [34] and Renjith et al. [35], sample gathering use snowball sampling is generally carried out gradually from one respondent to the next, so that sample data collection will continue and/or stop after the data is saturated or all the data and information sought have been obtained. The process of data collection must be rolled from one respondent to another because there is social or communication patterns (sociometrics) in a particular community [36], including the social patterns of the *Repong Damar* management community. Respondents were determined by purposive sampling, i.e., forest farmer group administrators who manage and utilize various vegetation including Damar growing in the *Repong Damar*. This study used an instrument in the form of a semi-open questionnaire, containing questions about the characteristics of respondents, such as age, level of education and duration of stay, and studied about the types of vegetation that exist, the types of utilization of vegetation and the socio-economic ecological functions of vegetation.

2.2.2 Data collection techniques

Primary data and secondary data were collected through questionnaire instruments and literature studies. Primary data on the variety of useful and beneficial vegetation types were collected based on a questionnaire with closed and open questions. The questionnaire has been tested for validity and reliability with a score of sig. < 0.05 and Cronbach-alpha value > 0.6. This test is used to determine whether the instrument is eligible and valid for use [37]. Based on the results of the questionnaire test that has been carried out, it is found that the questionnaire is valid and eligible for use. Data collection based on questionnaires is carried out by in-depth interviews. According to Ringa [38], testing can be done using information obtained from data collection through informants using the in-depth interview method.

2.3 Data analysis

2.3.1 Index of Cultural Significance (ICS)

Questionnaire data obtained from semi-structured interviews were processed and analyzed quantitatively and qualitatively based on the identification of plant species, plant uses, intensity of plant use, and plant exclusivity [39]. Furthermore, Turner [40] stated that the data matrix on the types and benefits of each plant mentioned by respondents was then analyzed and discussed to determine the ranking of plant benefits and at the same time to determine the Index Cultural Significance (ICS). The ICS value is used to measure the value of the benefits of a plant species for the community that refers to the intensity value, exclusivity value and quantity value. The formula for ICS is as follows.

$$ICS = \sum_{i=1}^{n} (q \times i \times e)_{ni}$$

Each data in the form of plant species has several uses so the following equation is obtained.

$$ICS = \sum_{i=1}^{n} (q_1 \times i_1 \times e_1)_{n1} + (q_2 \times i_2 \times e_2)_{n2} + \cdots + (q_n \times i_n \times e_n)_{nn}$$

where,

q= quality of use value

i= intensity of use value

e= exclusivity of use value

Turner allocates 5 weight scales for quality of use and intensity of use variables, namely 5, 4, 3, 2, 1 and allocates 3 scales for exclusivity of use variables, namely 0.5, 1, and 2. There are three components in the calculation and formula of ICS, including "Quality of Use", namely the nature and role of culture on plant benefits; "Intensity of Use," which is the impact of a plant on daily life based on local culture; and "Exclusivity of Use," which is the extent to which certain types of plants have an advantage over other types of plants [40]. According to research [33], the results of the cultural importance index have a value that can be categorized as Table 1 follows.

Table 1. Categories of Index of Cultural Significance (ICS)

No.	Range of ICS	Categories
1	> 100	Very high
2	50-99	High
3	20-49	Medium
4	5-19	Low
5	< 4	Very low

2.3.2 Spearman rank correlation test

Determination of the correlation between respondent characteristic variables is carried out using the Spearman Rank data analysis method. This test is used to determine the strength and level of relationship between two variables of

observation [41, 42]. The X variables in this study are the characteristics of respondents, such as the level of education, age of respondents, and duration of stay. Meanwhile, variable Y is the ICS value. According to Sugiyono [32], determining the level of correlation degree can refer to Table 2.

Table 2. Range of relationship strength coefficient

No.	Coefficient Range	Strength
1	0.000–0.199	Negligible
2	0.200–0.399	Weak
3	0.400–0.599	Moderate
4	0.600–0.799	Strong
5	0.800–1.000	Very Strong

Besides using the table above, the determination of correlation is based on the significance value of the analysis results. The hypothesis (H0) is accepted if the significant value is < 0.05, so there is a significant relationship between the variables [43].

3. RESULTS AND DISCUSSION

3.1 The ICS based on diversity of local plants in *Repong Damar* forest

One of the ecological functions can be identified based on species diversity [44, 45]. Based on this, this research conducted an analysis of the diversity of vegetation types. The Krui indigenous people knows that 29 species have various uses, some are spices, fruit plants and woody plants, some of which are classified as multi-purpose tree species. The MPTs plants are trees that are deliberately planted and managed for more than one function. The MPTS types usually produce products in the form of fruit, nuts, or leaves that can be used as vegetables, as well as supply firewood, add nitrogen to the soil, or supply some other combination of production results [46]. They have known that 12 of 29 species can be use as medicinal plants. The diversity of vegetation types used by the community around the *Repong Damar* can be seen in Table 3.

Table 3. The diversity of useful vegetation types along with the value of the Index Cultural Significance (ICS) in the *Repong Damar*

No.	Scientific Name	Local Name	ICS	Category	Utilization of Plants
1	*Archidendron pauciflorum* (Benth.)	Jengkol	4	lowest	Food producing
2	*Archidendron bubalinum* Jack.	Kabau	4	lowest	Food producing
3	*Pterospermum javanicum* Jungh.	Bayur	4	lowest	Construction material
4	*Piper nigrum* L.	Lada	4	lowest	Spices
5	*Toona sureni* Merr.	Suren	4	lowest	Construction material
6	*Colocasia esculenta* Schott.	Talas	4	lowest	Food producing
7	*Garcinia mangostana* L.	Manggis	4	lowest	Fruit, drug
8	*Gnetum gnemon* L.	Melinjo	4	lowest	Food producing
9	*Artocarpus heterophyllus* Lam.	Nangka	4	lowest	Fruit, food producing, construction material
10	*Parkia speciosa* Hassk.	Petai	4	lowest	Food producing
11	*Baccaurea racemose* Muell.	Tupak/ Kemundung	4	lowest	Fruit
12	*Coffea sp*	Kopi	4.5	lowest	Food producing
13	*Ricinus communis* L.	Jarak	4.5	lowest	Drug
14	*Orthosiphon stamineus* Benth.	Kumis kucing	4.5	lowest	Drug
15	*Peperomia pellucida* (L.) Kunth	Daun suruhan	4.5	lowest	Drug
16	*Piper betle* L.	Sirih	4.5	lowest	Drug
17	*Mikania micrantha* Kunth.	Menyansam	4.5	lowest	Drug
18	*Acorus calamus* L.	Jerangau	4.5	lowest	Drug
19	*Chrysanthemum grandiflorum*	Seruni	4.5	lowest	Drug
20	*Durio zibethinus* Murray.	Durian	5	low	Fruit
21	*Artocarpus integer* Merr.	Cempedak	6	low	Food producing
22	*Lansium domesticum* Corrêa.	Duku	6	low	Fruit
23	*Cocos nucifera* L.	Kelapa	7	low	Food producing, drinks
24	*Persea americana* P. Mill.	Alpukat	21	medium	Fruit, drug, firewood
25	*Peronema canescens* Jack.	Sungkai	21	medium	Firewood, drug
26	*Shorea javanica*	Damar	22.5	medium	Construction material, firewood
27	*Alpinia galanga* (L.) Sw.	Lengkuas	21	medium	Spices, drug
28	*Curcuma longa* L.	Kunyit	28	medium	Spices, drug
29	*Zingiber officinale* Rosc.	Jahe	42	medium	Spices, drug

Note: Primary Data, 2022.

Based on the results of the ICS analysis, it is known that there are 19 types of plants that are the lowest, which means that all of these plants are not widely used by the community. This happens because 19 species of plants are considered useless based on their culture. According to study [40], the more useful a plant, the greater its importance. The study [40] also argues that the definition and benefits of plant resources will differ from one ethnicity to another. This is evident in the field, where coffee has a low ICS value for the *Repong Damar* forest management community, but a high ICS value for the Batutegi Forest Management Unit protected forest management community [47].

3.2 Correlation of Krui indigenous characteristics to ICS

Indonesia as a mega biodiversity country has the potential for local plants that can be utilized. As has been done by the indigenous people of Krui in utilizing plants in the *Repong Damar*. Based on this, this study was conducted to analyze the ICS value based on the characteristics of the Krui indigenous community. The results of the analysis are presented in the form of a pie chart (Figure 5) with the percentage value of

correlation in each variable of respondent characteristics. The correlation value is shown in the form of two kinds of percentages, namely negative percentage, and positive percentage, which illustrates the direction of the correlation given by the respondent's characteristic variable to ICS. The direction of this correlation will be useful to determine the magnitude of influence and impact that can be given by the characteristics of local communities on the important value of ICS. The percentage value of the correlation between respondent characteristics (education, age, and duration of stay) and the ICS important value index can be seen in Figure 5.

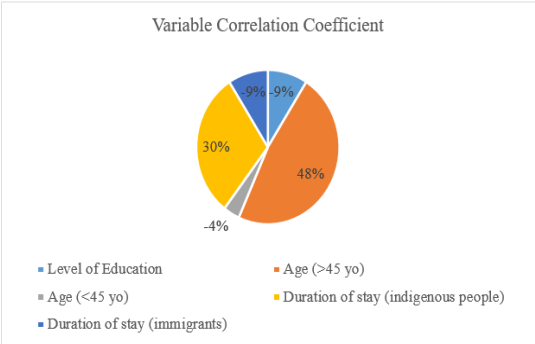

Figure 5. Percentage correlation of respondent characteristics to ICS values

Based on the calculation results, ICS shows the value and significance of each useful plant species based on the needs of the community [39, 48]. In general, plant utilization based on ICS is related to the local wisdom of the local community. The community utilizes plants according to their knowledge and characteristics. In this study, the relationship between the characteristics of indigenous peoples (education level, age, and duration of residence) to ICS based on plant knowledge variables was analyzed. The description of the correlation analysis is detailed below.

3.2.1 Correlation between education level and ICS

Indigenous peoples have favorable characteristics in forest management and utilization. They are very dependent on the natural resources within them. This management and utilization can be based on the knowledge of indigenous peoples, which can be influenced by the level of education [49, 50]. In the *Repong Damar*, indigenous knowledge is related to the utilization of plant use. The level of education itself can reflect how high and low the knowledge of the Krui indigenous people in the utilization of medicinal plants and related ICS values [51]. Having a high level of knowledge can provide more opportunities for the community to utilize plants, such as medicines, firewood, food ingredients, and others. Furthermore, the correlation between the level of education of the Krui indigenous people towards knowledge and ICS can be seen in Table 4.

Table 4. Correlation between education level and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Level of education	Correlation Coefficient	-0.192	-0.281	-0.284	-0.281	-0.129
	Sig. (1-tailed)	0.082	0.020*	0.019*	0.020*	0.177
	Sig. (2-tailed)	0.164	0.040*	0.037*	0.040*	0.353

Ethnobotany is associated with ethnoecology and conservation biology, so indigenous knowledge is very important for forest conservation and sustainability [52]. The results of the analysis in the table above show that there is a significant value (1-tailed) of the level of education on ethnobotanical variables, namely knowledge of plants (0.020), knowledge of the benefits of ethnobotany (0.019), and knowledge of the efficacy of medicinal plants (0.040). However, these results show a negative or inversely proportional variable relationship value, which means that the high level of knowledge about ethnobotany is not always influenced by the high level of community education. In addition, based on the table above, the level of education does not have a significant relationship with knowledge of protected forests and the value of plant use (ICS). In contrast to the research of [53, 54], that knowledge of the value of use is based on traditional knowledge. This goes back to how the skills, mindset, and capture power possessed by indigenous peoples regarding ethnobotany. Based on the results of field observations, there is no limit to the education of indigenous people to be able to preserve and utilize the types of plants in *Repong Damar*. People tend to use their initiative and skills in using various plants as fulfillment of daily needs, such as feedstuffs, clothing, and the need for medicines. Krui indigenous people are indigenous people who are very dependent on *Repong Damar* products. This dependency can be influenced by the level of community education [55]. The level of education affects the knowledge of the use of plants that have been inherited from generation to generation as local wisdom. Indigenous peoples who have high culture will be able to utilize and manage plant diversity in an optimal way [56]. Given the loss of knowledge about the use and value of plants, the community has an important role in knowing local plants and distributing their knowledge. Therefore, it is necessary to help in maintaining the sustainability and use value of plants in the *Repong Damar* so that indigenous peoples are aware of maintaining and appreciating the heritage of local wisdom [57].

3.2.2 Correlation between age and ICS

There have been many studies related to the relationship between humans and plants in an ecosystem. This is a form and effort to conserve biodiversity in preserving and documenting the benefits of plants [39]. Many threats can impact natural resources, including deforestation, and overexploitation. Therefore, indigenous peoples need to be aware and know the application of conservation efforts in utilizing natural resources to remain sustainable [58, 59]. The

experience of indigenous peoples determines how conservation efforts can be carried out, where people who have long experience will know the characteristics of the ecosystem and the plants used. The increase in experience goes hand in hand with the increase in community age. Table 5 below shows the correlation between community age and knowledge of ethnobotany and medicinal plants.

Based on the table above, there is a positive correlation between the age of the community and the knowledge of ethnobotany and medicinal plants. This shows that the older the age, the more knowledge and experience of the community in terms of ethnobotany and the use of medicinal plants. The elderlies certainly have more skills than young people. It might be given difference impact between the elderly and young people in utilizing plants in the *Repong Damar* forest. There is a difference in the correlation between young and old communities. In this study, the age of indigenous peoples was categorized into two categories, that is, age > 45 years and age < 45 years. An explanation of the correlation results based on these categories is described in Table 6 below.

According to studies [60, 61], people who are more productive in utilizing plants are at the age of >40 years. This is in line with the research results in the table above, that there is a positive correlation between community age (>45 years) and knowledge of ethnobotany and medicinal plants. This correlation shows that older people have more interest in the use and utilization of medicinal plants than younger people. As in the findings and based on the results of interviews with respondents, high-skills in utilizing *Repong Damar* products are owned by elderly generations, and it is proven that many farmers in the *Repong Damar* are elderly (>45 years). Then, it is supported based on the results of research [62], that the older generation of people aged 35 years and above have higher ethnobotany knowledge compared to the younger generation. As in Figure 6, which shows the processing of *Repong Damar* harvests carried out by the older generation community.

Figure 6. The processing of resin harvest

Older people still secure cultural principles and knowledge from their ancestors about the benefits of plants around them, so for the younger generation it is not appropriate to be implemented in the current era [60]. This can be seen based on the research results in Table 7.

Table 5. Correlation between age and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Age	Correlation Coefficient	0.321	0.486	0.490	0.486	0.218
	Sig. (1-tailed)	0.009*	0.000*	0.000*	0.000*	0.057
	Sig. (2-tailed)	0.018*	0.000*	0.000*	0.000*	0.113

Table 6. Correlation between age (> 45 years) and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Age (>45 years)	Correlation Coefficient	0.200	0.200	0.200	0.200	0.076
	Sig. (1-tailed)	0.136	0.136	0.136	0.136	0.340
	Sig. (2-tailed)	0.272	0.272	0.272	0.272	0.681

Table 7. Correlation between age (< 45 years) and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Age (<45 years)	correlation Coefficient	0.009	-0.490	-0.412	-0.490	-0.053
	Sig. (1-tailed)	0.484	0.010*	0.029*	0.010*	0.408
	Sig. (2-tailed)	0.969	0.021*	0.057	0.021*	0.816

Age (< 45 years) was correlated to ICS scores, but the correlation was negative, which means that people with young age do not have a significant influence on ICS knowledge and medicinal plant knowledge. In line with the research by Kidane et al. [58], young people are less concerned about medicinal plant knowledge in terms of sharing, recording, and traditional medicine processes. Young people prefer to use modern medicine compared to traditional medicine using

medicinal plants. Young people are less interested in the use of medicinal plants, this will have an impact on the loss of local culture for future generations [60]. Most young local people in Krui were born in the globalization era, in which modernization has grown rapidly. This has made the younger generation in Krui less interested in local wisdom, especially in management of resin culture. According to Roslinda et al. [63], older farmers dominate forest management compared to younger farmers. The lack of interest of the younger generation can be caused by several factors, including the influence of technological developments, the lifestyle of the younger generation, and the lack of support from external parties, in this case the government [60]. The more technology develops, the less implementation of local knowledge [62].

3.2.3 Correlation analysis between length of stay and ICS

Communities living around forests often have rich local knowledge about the plants around them. They may know the types of plants that can be used for food, medicine, or building materials. Forest-dwelling communities are often involved in sustainable forest management. They have knowledge on how to maintain ecological balance and utilize forest resources wisely. Communities living around forests have a high dependence on forest products. They rely on forest plants for their daily needs, such as food, fuel and building materials [64]. Living in the forest can provide opportunities to study and observe biodiversity. People who live in the forest can have in-depth knowledge about various types of plants and ecosystems around them. By living in the forest for a long period of time, communities can develop rich knowledge about plants and forest ecosystems (Table 8). This knowledge can be used to sustainably utilize forest resources and maintain biodiversity.

Table 8. Correlation between duration of stay and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Duration of stay	Correlation Coefficient	-0.111	0.233	0.185	0.233	-0.010
	Sig. (1-tailed)	0.211	0.045*	0.090	0.045*	0.471
	Sig. (2-tailed)	0.423	0.090	0.180	0.090	0.941

The population of Lampung consists of 2 (two) categories, the local indigenous people, and the migrants. The indigenous people are the original residents who have long settled and even for generations inhabited the Lampung area. Meanwhile, migrants are immigrants who live and settle [65]. These two types certainly have differences that are influenced by demographic factors, including in terms of plant utilization in the *Repong Damar* Forest [66]. Table 9 and Table 10 below show the correlation results of the stay duration of the Krui community to the ICS.

Table 9. Correlation between duration of stay (indigenous people) and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Duration of stay (indigenous)	Correlation Coefficient	0.708	0.708	0.708	0.708	0.437
	Sig. (1-tailed)	0.000*	0.000*	0.000*	0.000*	0.013*
	Sig. (2-tailed)	0.001*	0.001*	0.001*	0.001*	0.026*

Table 10. Correlation between duration of stay (migrants) and ICS

Variable	Correlation Analysis Results	Knowledge of the Importance of Protected Forests	General Knowledge of Forest Plants	Knowledge that Ethnobotany is Useful	Knowledge of Medicinal Plants	ICS
Duration of stay (migrants)	Correlation Coefficient	-0.432	0.137	0.074	0.137	-0.129
	Sig. (1-tailed)	0.011*	0.244	0.353	0.244	0.257
	Sig. (2-tailed)	0.022*	0.487	0.707	0.487	0.513

The results indicated a significance value or Sig. (2-tailed) of 0.001 or smaller than 0.050, it can be assumed that there is a significant relationship between the variable length of stay of indigenous people with knowledge related to the importance of protected forests, general knowledge of vegetation in the forest, knowledge that ethnobotany is useful, and knowledge of the efficacy of medicinal plants. As for the variable length of stay with the amount of ICS value, it shows a significant relationship because the significance value is 0.026. This shows that the longer the indigenous people of Krui occupy an area around the *Repong Damar*, the knowledge of the importance of protected forests, forest vegetation, ethnobotanical knowledge, and knowledge of the efficacy of medicinal plants increases. Indigenous people have

longer time adapted to resin forests compared to migrant communities [66]. This condition shows that they have superior skills and understanding of various types of local plants management in *Repong Damar* compared to migrant communities. Local people often have extensive knowledge about the forest itself (especially the surrounding forest area) due to personal experience and long-term observations as well as real lessons from their parents and ancestors [67]. Zuhud and Santosa [68], stated that some productive-aged people have lived in the Jompi forest area for a long time and have interacted a lot with the existing forest area. Therefore, they know better how to utilize a species of medicinal plants that have been used in everyday life for generations. This is because in their daily lives they use and utilize medicinal plants themselves.

The significance value or Sig. (2-tailed) variables of knowledge related to the importance of protected forests, general knowledge of vegetation in the forest, knowledge of plant usefulness is 0.022; 0.487; and 0.487 or smaller than 0.050, so it can be assumed that there is a significant relationship between these three variables and the duration of stay of migrant communities. The significant values of the variables of knowledge that ethnobotany is useful and ICS on the length of stay of migrants are 0.707 and 0.513 or greater than 0.05, respectively. Thus, the variable of knowledge that ethnobotany is useful and the variable of the value of ICS do not have a significant influence on the length of stay of migrant communities. The value of the correlation coefficient between the variable duration of stay and knowledge of the importance of protected forests is -0.432 (negative), which means that it has a strong correlation level and is negatively correlated. Meanwhile, the variables of general knowledge about vegetation in the forest, knowledge that ethnobotany is useful, and knowledge of the efficacy of medicinal plants have a positive correlation but the level of correlation is relatively weak. The relationship between the duration of stay of migrants and the ICS value variable (-0.129) is negatively correlated and the level of correlation is very weak. Wijaksono [69] stated that the longer a person lives and settles in an area, in general, will have a positive influence so that awareness grows to maintain, develop, and manage the forest area. People generally have more knowledge about the use of plants for various purposes [37]. The relationship between the utilization of vegetation by local communities and how plants are used for food, wood, fuel, decoration, and medicine is a branch of ethnobotany. One of the objectives of ethnobotany is to report, record and preserve local vegetation wisdom [70-72]. Traditionally, ethnobotanical knowledge has been passed down orally from generation to generation. To prevent the extinction of this knowledge it is important to document and preserve it for future generations [73].

Repong Damar forest management culture is one proof that the existence of a culture and local wisdom can have an impact and sustainability for indigenous people's livelihood [29]. Basically, the community has specific characteristics for managing *Repong Damar*. Like those in the *Repong Damar*, the characteristics of these indigenous peoples have a correlation on the utilization of *Repong Damar* resources. Based on the results of the study, the level of education of indigenous peoples does not have a significant correlation to the sustainability of *Repong Damar* forest, especially in the utilization of plant species diversity. According to study by Sauini et al. [74], many people are poorly educated but have good skills, including in terms of preserving resin ecosystems. This is also inseparable from the influence given by the age and length of stay of indigenous people. The elderly community (> 45 years old), who are the indigenous people of Krui, has proven to have a real correlation on the high ICS important value index. These communities have better skills, experience, and knowledge about various types of plants, plant benefits, and plant uses for the community compared to the younger generation or those less than 45 years old and migrant communities [62]. Therefore, there is a need for socialization, mentoring, extension education series, training, and informal education by the government, NGOs, or other parties in an effort to transfer knowledge from the elderly and indigenous communities to people who do not have adequate skills in the management and utilization of various types of plants in *Repong Damar* [63, 74].

4. CONCLUSIONS

Lampung indigenous tribe is an indigenous tribe of Lampung province that has local wisdom in the management of *Repong Damar*. One of the local wisdoms is the use of plants (ethnobotany) around *Repong Damar* in the daily lives of indigenous people. This concept provides ecological, social, and economic benefits. Of the various types of plants around the *Repong Damar*, ginger (*Zingiber officinale* Rosc.) is the plant that has the highest ICS value, which is worth 42 and Shorea itself has 22.5. This shows that indigenous people around the *Repong Damar* use ginger as medicinal plants in their daily lives based on their culture. This condition also proves that the community has a high understanding of the use of medicinal plants because they use 12 of the 29 species found for medicinal purposes. The characteristics of indigenous peoples such as age (> 45 years) and the duration of stay (indigenous people) are positively correlated with ICS, this condition means that local communities over 45 years old have a correlation on the high value of ICS and the sustainability of plants from *Repong Damar* forest. Meanwhile, the level of education, age (< 45 years) and duration of stay (migrants) are negatively correlated with ICS, which means that a high level of education does not determine the high knowledge and value of ICS, as well as migrants and the younger generation do not affect the high value of ICS. Based on this condition, the community needs informal education, for example trainings or relevant extension education series.

Basically, community education will have implications for the knowledge possessed in managing *Repong Damar*. In addition, young local communities are expected to have better potential than elderly people in terms of knowledge and skills in utilizing and managing plant species. However, in fact, based on the results of research, the inheritance of local wisdom in the younger generation in managing *Repong Damar* is declining. Thus, there is a need for efforts and strategies to preserve the customs of local communities in forest conservation, especially in *Repong Damar*. In addition to the older generation community, the government, NGOs, or other parties should have a role in the development of local human resources through socialization, training, and mentoring activities. Based on the results of this study, it is hoped that the resulting recommendations can support the preservation of various types of plants in *Repong Damar* based on the characteristics and local wisdom of the community. This research is inseparable from the shortcomings and limitations that exist; for example, the number of respondents

in the research location is minimal, so similar research is needed in several other areas to enrich the results of similar research that can support the strategy development for the preservation of *Repong Damar* forest on a broad scale based on the characteristics of the community.

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