

## LOCAL WISDOM-BASED CONSERVATION ETHICS OF TABARU TRADITIONAL COMMUNITY ON HALMAHERA ISLAND, INDONESIA

Mimien Henie Irawati AL MUHDHAR<sup>1</sup>, Fatchur ROHMAN<sup>1</sup>, M. Nasir TAMALENE<sup>2\*</sup>,  
Wawan S. NADRA<sup>2</sup>, Alfian DAUD<sup>2</sup>, BAHTIAR<sup>2</sup>, Hudan IRSYADI<sup>3</sup>

<sup>1</sup> Faculty of Mathematics and Natural Science, Universitas Negeri Malang, Indonesia

<sup>2</sup> Biologi Universitas Khairun Jl. Bandara Babullah Kampus 1 Akehuda Ternate, Indonesia

<sup>3</sup> Antropologi Universitas Khairun Jl. Yusuf Abdurahman Gambesi Ternate, Indonesia

---

### *Abstract*

*Natural preservation is closely related to cultural identity, religious spiritual values, and recreational activities that give contribution to the life quality of human population. Local community uses shared resources and responsible for environmental changes occurred in their surroundings. The research aims to analyze religious and cultural-based conservation practices affecting the biodiversity preservation. The research finds that Tabaru traditional community had local knowledge related to bio natural resources conservation ethics, especially plants, by using religious-based cultural control. Three methods were found: Sasi, Kasse tanda and Cincang. The conservation values of Sasi method are religious-based plant protection, utilization, and management. The community believes that if Sasi posited in their farm, God will protect and increase their farm yield and reduce various diseases attack. Kasse tanda in the tradition of Tobaru traditional community is practiced aiming at improving the number of fruits and enlarge their size. In addition, Kasse tanda method could repel pests, for example pest that will damage the vegetative organs of plant, such as leaves and stems, and generative organs, such as flowers, fruits, and seeds. Cincang method is stem incision method. The method is functioned to reduce coconut bud rot and nutfall diseases. The method is very effective and practiced up to now. Strategies to maintain Tabaru traditional community's local wisdom to protect biodiversity were: 1) integrating local cultural education in school curriculum, and 2) create a social engineering in form of custom rules thus maintain positive local culture.*

**Keywords:** *Conservation ethics; Religion; Culture; Tabaru traditional community*

---

### **Introduction**

Local community lives in the village uses natural resources for various interests, namely: foodstuffs, drug, building, and aromatic. In addition to the direct benefit, bio-natural resources are made as a life symbol. Traditional cultural practices take place for generations using oral tradition. Modernization factors cause oral tradition of local community in terms of natural resources protection is decreasing despite its role as the inheritance of traditional community ancestors. Ethnic in Indonesia depend on forest product [1-2]. Bio-natural resources are traditionally protected treasures [3]. Traditional protection and utilization is part of customary

---

\* Corresponding author: [hannakhairunnisa2013@gmail.com](mailto:hannakhairunnisa2013@gmail.com)

law structure made to protect natural balance [1]. Mitigation measures are conducted to improve the quality of environment and local community life [5].

Balanced bio-natural resources utilization is a form of local knowledge protected in local community culture. Natural conservation is closely related to cultural identity, religious spiritual values, and recreational activities that give contribution to the life quality of human population [5]. Local community uses shared resources and responsible for environmental changes occurred in their surroundings [6]. The relationship between local community and their residential environment is a part of inseparable direct interaction. The relationship leads to the accumulation of environmental change and environmental processes knowledge [7].

Local community has knowledge that protecting the nature means providing a valuable foundation to help preserving their spiritual and religious values [8]. In Indonesia, plants and animals protection practice is conducted by ethnics who live traditionally in the village. They utilize the plants and animals to fulfill their life necessities. Traditional protection concept is a community ethic maintained in the community's cultural system. Local community culture is inherited from generation to generation, from old generation to young generation. Religious and cultural values-based traditional protection practices are conducted by local communities in Indonesia to protect plantation areas.

*Tabaru* traditional community is one of ethnics in eastern Indonesia who live on Halmahera Island. They have traditional knowledge practiced in their daily life. Their traditional life utilizes plantation produces and forest products to fulfill the basic needs. They depend on natural resources for their economic and cultural needs. In this research, we analyzed religious and cultural approach-based plant conservation practices. We described how is cultural contribution in environment and the implementation practice of God values in their life. We also analyzed the traditional knowledge practices and relationship between cultural practices and environment. We discussed several implications of religious- and cultural-based conservation practices influencing the biodiversity preservation.

## Methodology

Research locations were the western part of Halmahera Island, which were Podol (N 1°31' 26.912" E 127°33' 43.420"), Tengowango (N 1°31' 26.912" E 127°33' 43.420"), Togowo (N 1°32' 06.806" E 127°35' 12.564"), Duono (N 1°32' 32.766" E 127°36' 14.131"), Goin (N 1°33' 07.632" E 127°37' 22.180"), Sangaji Nyeku (N 1°32' 58.402" E 127°37' 31.946"), Tuguis (N 1°32' 51.083" E 127°38' 08.048"), Togoreba Sungai (N 1°32' 34.094" E 127°38' 25.253"), Barona (N 1°32' 27.923" E 127°39' 05.369"), Todoke (N 1°32' 40.637" E 127°38' 48.869"), Tolisaor (N 1°31' 32.471" E 127°40' 17.686"), Pasalulu (N 1°31' 21.008" E 127°40' 33.355"), and Togareba Tua (N 1°29' 31.444" E 127°41' 15.236") Villages. Research location map is presented in figure 1.

The villages' location is directly adjacent to the active volcano. The villagers' plantation is located at the height of 15-780 a.s.l. Research informants were selected using purpose sampling with 37 people as the key informants. In each village 3 informants were selected in different age group (Table 1). Informants were selected for interview and information collection related to name, age, gender, and level of education (Table 2). The informants consisted of members of the traditional community groups who have knowledge of and have been practicing religious and cultural-based conservation practices. It is important to note that there were no official records on the number of population and demographic data of the studied villages.

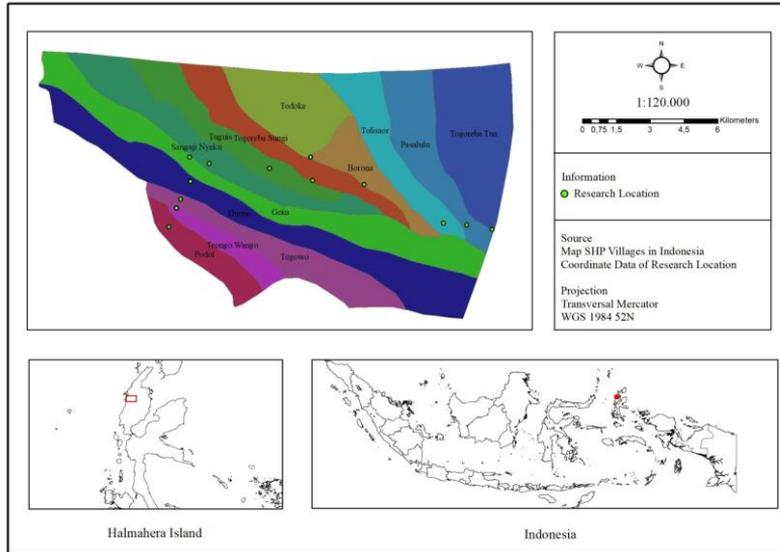


Fig. 1. Map of the study areas

Table 1. Age Group and Gender Distribution of Informants

Age group	Gender		No. of persons	percentage
	Male	Famale		
40-49	7	2	9	24.32
50-59	5	4	9	24.32
60-69	6	3	9	24.32
70-79	6	1	7	18.92
80-89+	2	1	3	8.11
<b>Total</b>	<b>26</b>	<b>11</b>	<b>37</b>	

Table 2. Education level of Informants

Education level	No. of individuals	Percentage
Illiterate	8	21.62
Primary	24	64.86
Middle	2	5.41
Secondary	2	5.41
University	1	2.70
<b>Total</b>	<b>37</b>	

Data collection method used interview technique, discussion group, field observation, and documentation [9, 10]. The traditional communities depended on horticultural crops and livestock (pig, cow, goat, and chicken). A semi-structured questionnaire built as a tool for interview. The questionnaire’s main goal was to understand local knowledge of traditional community on conservation ethics practiced in their villages. Population in thirteen villages was interviewed openly. In the beginning, the interview was conducted using a tape recorder; however the informants felt uncomfortable thus it was conducted using direct transcription method, which is recording all information on transcript sheets.

Every informant was interviewed one by one after they were introduced to the project goals using semi-structured questionnaire developed to facilitate data systematization and analysis. Field observation was done by visiting the plantation areas where religious-based conservation practices conducted. All interview and research activities were recorded with previous agreement from the informants.

Research result data in form of interview result and field records was analyzed using inductive qualitative analysis, which is an analysis based on data obtained. Qualitative data analysis consists of three activity flows occurred simultaneously, namely: data collection, data reduction, data presentation, and conclusion drawing/verification [10].

## Results

*Tabaru* traditional community on Halmahera Island had local knowledge related to bio-natural resources conservation ethics, especially plants using *religious-based cultural control*. Cultural control is the use of horticultural practices that influence plant protection, prevent diseases occurrence on plant, and increase plant yields. The activity aims to improve plant resistance towards pests and diseases and increase fruit production. We found three conservation ethic methods practiced by the community, namely:

### *Sasi Method*

In *Tobaru* language, *Sasi* means an oath. *Sasi* has religious and social values and a violation brings punishment or fine from the traditional community in the village. *Sasi* procedures are:

a) People who have coconut (*Cocos nucifera* L.), nutmeg (*Myristica fragrans* Houtt.), clove (*Syzygium aromaticum*), Cacao (*Theobroma cacao*), Langsa (*Lansium domesticum* Corr.), Rambutan (*Nephelium lappaceum* L.), *Salak* (*Salacca zalacca* Gaertn.) Voss and Durian (*Durio zibethinus* Murr.) plantation land make a promise (*Sasi*) to God;

b) The traditional community conduct prayer to God ritual;

c) *Sasi* plantation is required to deposit 10% of their harvest to the traditional community administrators;

d) *Sasi* plantations are announced to the traditional community thus they aware of their existence and then informed them to all family;

e) *Sasi* plantation will be marked with a symbol placed in the plantation.

*Sasi* values could change according to the sale value of community plantation' yields. The research data obtained from local market sale value data.

Based on the interview result and location visit data, *Sasi* method found in all *Tabaru* traditional community villages; however, it was mostly found in Togereba, Sungi, Borona, and Todoke Villages. According to the informants, since 2002, *Sasi* practice started to be abandoned. Data on *Sasi* practice in the research was taken for 5 years period, 2014-2018. The number of family practicing *Sasi* method on their plantation land is displayed in Table 4 with average percentage based on year (Fig. 2). The validity period of *Sasi* was not clearly explained; however if there was a family wanted to have their plantation to be put in *Sasi* they will asked the traditional community administrator.

Table 3. List of *Sasi* Plant Name for Traditional Community

Family Name	Indonesia Name	Scientific Name	Sale Value (kg) [IDR]	<i>Sasi</i> Value [IDR] of 10% for the traditional Community
Arecaceae	Kelapa*	<i>Cocos nucifera</i> L.	6000	600
Myristicaceae	Pala*	<i>Myristica fragrans</i> Houtt.	85.000	8.500
Myrtaceae	Cengkeh*	<i>Syzygium aromaticum</i>	65.000	6.500
Sterculiaceae	Cacao**	<i>Theobroma cacao</i> L.	30.000	3.000
Meliaceae	Langsa**	<i>Lansium domesticum</i> Corr.	15.000	1.500
Sapindaceae	Rambutan**	<i>Nephelium lappaceum</i> L.	15.000	1.500
Arecaceae	Salak**	<i>Salacca zalacca</i> Gaertn. (Voss)	10.000	1.000
Bombacaceae	Durian**	<i>Durio zibethinus</i> Murr.	50.000	5.000

\*practiced until now      \*\* not practiced

Table 4. Number of *Sasi* Practice

Village	Number of Total Family	Year				
		2014	2015	2016	2017	2018
Togoreba Sungai	312	7	3	4	2	2
Barona	216	2	4	2	3	2
Todoke	275	3	2	2	4	3

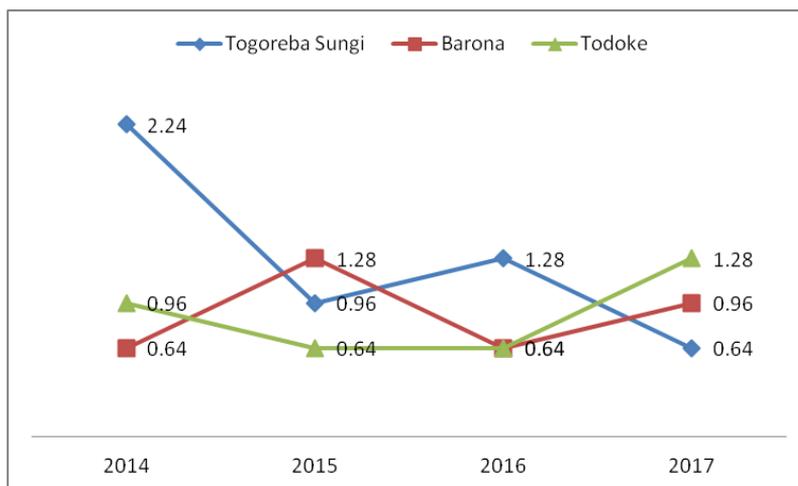


Fig. 2. Average Value of *Sasi* Utilization Percentage based on Year

The research finding gives important information that Tabaru traditional community on Halmahera Island had abandoned the religious and cultural practices. They said that the practices are outdated and ancient. The statement is proven by the interview result that, on average, in 4 years there was only 14.42% of the community used *Sasi*, which was Togoreba Sungai (5.77%), Barona (4.17%) and Todoke (4.49%) Villages, whereas 82.58% knew about *Sasi* function but they did not use it, and 3% did not know directly about the use value of *Sasi*.

### *Conservation Value*

*Sasi*' method conservation values were religious-based plant protection, utilization, and management. The community believed that if *Sasi* placed in their plantation, God will protect and increase the yields, and reduce diseases attack. However, *Sasi* has prohibition that it is prohibited to take harvest for personal or group gain. If someone is found to intentionally take the harvest of *Sasi* plantation, he/she will sick since he/she is considered as breaking the agreed oath. *Sasi* method is a form of community belief on the existence of God in their life. The *Tabaru* traditional community believes that God protects their plantation and life, gives sustenance and fertile land, increases harvest yields, and protects the plantation yield from various diseases.

### *Religious Values*

According to *Tobaru* traditional community, *Sasi* is religious values originated from the highest truth of God who regulate human life and their surroundings. The truth of these values must be absolutely done otherwise they will disavow their oath to God. According to them, religious values need to be implemented as a form of worshipping God. The religious aspect is closely related to sacred and impure values. These values need to be implemented to minimize damage on earth and maintain God creation for human life.

### *Kasse Tanda Method*

*Kase Tanda* is a symbol. In this method, the community believes that tie used clothes (woman underwear or bright color clothes) on plants will increase the number of fruits and enlarge their size. In addition, the method, according to them, could repel pests, such as insect, that damage the vegetative organs of plants, such as leaves and stems, and generative organs such as flower, fruits, and seeds. The method is especially practiced on *rambutan* (*Nephelium Lappaceum L.*), jackfruit (*Artocarpus heterophyllus Lam.*), banana (*Musa acuminata L.*) and *langsat* (*Lansium domesticum Corr.*). The method procedures are: i) selecting woman underwear or other bright color clothes, ii) the clothes are tied or placed on the tree branches that will grow fruit or have grown fruit, and ii) after harvest, the *Kasse tanda* is replaced with the new one. The method continues after harvest season is completed.

### *Conservation Value*

The meaning of placing woman underwear on plants is a symbol of plant management and protection in the community plantations that have direct benefit as the source of food and family economic income.

### *Cincang Method*

*Cincang* is a stem incision method. The method is functioned to reduce *coconut bud rot and nutfall diseases*. Farmers often find a certain type of coconut tree experiences fall fruit before harvest. Method used to overcome it was *Cincang*. The method is conducted by cutting the coconut stem in a circle. The diseases cause plant death and the fruits to fall before harvesting, especially at productive plant age. In one hectare coconut plantation, there were 14-25 plants experienced fruits fall symptoms before harvest. The coconut (*Cocos nucifera L.*) farmers had knowledge on a method to prevent coconut fruits to fall by cutting the coconut stem in a circle. The method is called *Cincang* method in local term. The local knowledge is inherited from their parents. The method is still practiced until now since it is effective to reduce the fallen fruits due to disease on coconut (*Cocos nucifera L.*) tree.

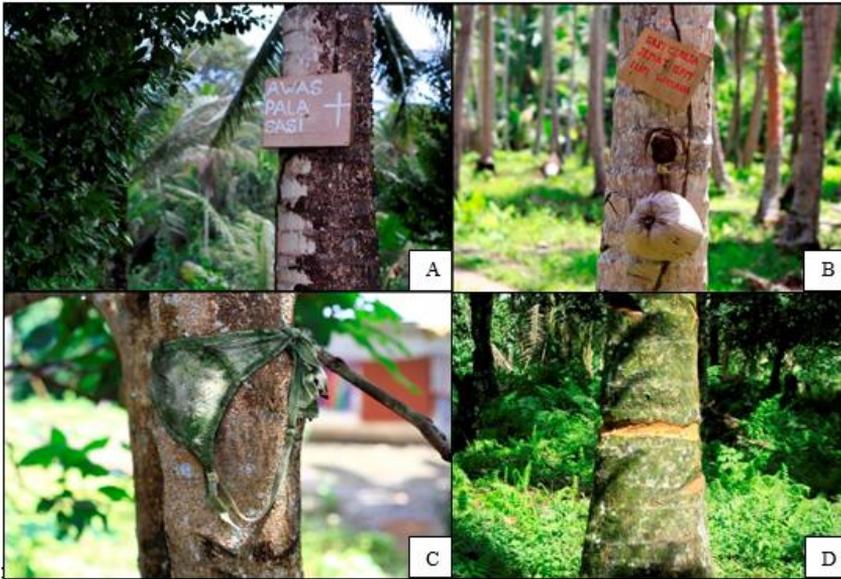


Fig. 3. [A] Nutmeg (*Myristica fragrans* Houtt.) Sasi, [B] Coconut (*Cocos nucifera*) Sasi, [C] Kasse Tanda method on mango (*Mangifera indica* L.) [D] Cincang method on coconut (*Cocos nucifera*)

## Discussion

The most effective method in biodiversity protection is using various approaches, among others, community local wisdom-based religious and cultural approaches. The fact indicated that *Tabaru* traditional community on Halmahera Island still used both approaches for the interest of plantation land protection. For example, *Sasi* as a method for religious-based plantation protection, *Kasse tanda* as a method to multiply yields and protect fruits from falling, and *Cincang* is a method to reduce diseases attacking coconut stalk. Currently, these approaches have started to be forgotten and only older people do them. The research result did not find young generation who are practicing the methods in planting activities. Plantation land that culturally protected is an effort to protect various economic- and social-valued plants [11, 12].

In Indonesia, traditional conservation practices are found in small islands area. Bio-natural resources conservation education using “religious power” approach is an effective way to maintain community’s positive behavior in protecting God creation in nature. In Indonesia, Islamic societies realize that all natural resources are created by God for human life necessities thus it is important to protect and use them wisely. Education strategy used is by stating the opinion of Islamic law (*fatwa*). Religious tradition to protect biodiversity is practiced according to religious orders of a community. Protecting the nature means providing a valuable frame to help in conserving their cultural, spiritual, and religious values [13, 14].

Modern technology development causes changes in biodiversity protection. Technology is used to protect various biodiversity types; however, it could also cause their loss. Cultural aspects from local population are integrated with ecological aspect related to biodiversity [15]. Traditional protection practice is a part of ritual to protect God creation. In addition, it is a cultural need in social [16]. Trees are essential thus local community in the villages protect and respect them as a cultural symbol [17-19]. Community have religious and social obligation to

participate in sustainable reforestation and maintain environmental ethics in order to protect biodiversity in their residence [20].

The research finding gives important information that local knowledge and the role of local communities in Indonesia need to be maximized as a reference for sustainable development in biodiversity conservation field. Local cultural, religious, and government regulation approaches need to be integrated thus it strengthens environmental security system in small islands area in Indonesia. Natural resources and cultural wealth are the strengths to build the nation. We found that traditional plant protection tradition gave social and cultural meanings. Communities at the village are the protector of biodiversity. Plants have direct benefits for their life necessities. Cultural and religious approaches practiced start to disappear since the young generation has less understanding on the importance of culture for biodiversity conservation. Strategies to maintain local wisdom of *Tabaru* traditional community to protect biodiversity are: 1) integrating local cultural education into school curriculum, and 2) create a social engineering in form of custom rules thus maintain positive local culture.

## Conclusions

*Tabaru* traditional community had local wisdom related to bio-natural resources conservation ethics, especially plants, using religious-based cultural control. There were three methods found, namely: *Sasi*, *Kasse tanda* and *Cincang*. *Sasi* method conservation values were religious-based plant protection, utilization, and management. The community believed that if *Sasi* placed in their plantation God will protect and increase the yield of the plantation, and reduce diseases attack. *Kasse tanda* in the tradition of *Tabaru* traditional community practiced to increase the number of fruits and enlarge the size. In addition, the method could repel pests, such as insect, that damage the vegetative organs of plants, such as leaves and stems, and generative organs such as flower, fruits, and seeds. *Cincang* is stem incision method. The method is functioned to reduce coconut bud rot and nutfall diseases. The method is very effective and it is practiced until now. Local wisdom-based protection practice is the tradition of *Tabaru* traditional community. The research gives important information to the communities as well as government that religious- and cultural-based plant management is interrelated and it is a social engineering concept of traditional community.

## Acknowledgements

The authors send their gratitude to the LP2M Universitas Negeri Malang for the research funding and to the *Tabaru* traditional community in West Halmahera as the key informants.

## References

- [1] M.N. Tamalene, M.H.I. Almudhar, *Local knowledge of Management System of Forestecosystem by Togutil Ethnic Group on Halmahera Island, Indonesia: Traditional Utilization Andconservation*, **International Journal of Conservation Science**, **8**(3), 2017, pp. 497-508.
- [2] J. Iskandar, B. Iskandar, *Local knowledge of the Baduy Community of South Banten (Indonesia) on the traditional landscapes*, **Biodiversitas**. **18**(3), 2007, pp. 928-938.

- [3] A.C. Hamilton, *Medicinal plants, conservation and livelihoods*, **Biodiversity & Conservation**, **13**(8), 2004, pp. 1477-1517.
- [4] C.A. Collier, M.S. de Almeida Neto, G.M.A. Aretakis, R.E. Santos, T.H. de Oliveira, J.S. Mourão, W. Severi, A.C.A. El-Deir, *Integrated approach to the understanding of the degradation of an urban river: local perceptions, environmental parameters and geoprocessing*, **Journal of Ethnobiology and Ethnomedicine**, **11**(69), 2015, pp. 1-13.
- [5] M.-A. Gutiérrez, M. Rosario, S. Alonso, M. Luisa, *Which are, what is their status and what can we expect from ecosystem services provided by Spanish rivers and riparian areas?* **Biodiversity and Conservation**, **22**(11), 2013, pp. 2469–2503.
- [6] S. Bell, *Landscape pattern, perception and visualisation in the visual management of forests*, **Landscape and Urban Planning**, **54**(1-4), 2001, pp. 201–211.
- [7] R.A.M. Silvano, A. Begossi, *What do people think about pollution? Contributions of Human Ecology to the study of river pollution with a focus on Brazil*, **River Pollution Research Progress** (Editors: M.N. Gallo and M.H. Ferrari), Nova Publishers Inc., New York, 2009, pp. 283–296.
- [8] M. Gadgil, F. Berkes, K. Folke, *Indigenous knowledge for biodiversity conservation*, **Ambio**, **22**(2–3), 1993, pp. 151–156.
- [9] G.J. Martin, **Ethnobotany: A ‘People and Plants’ Conservation Manual**. Chapman and Hall, London, 1995.
- [10] K.D. Norman, Y.S. Lincoln (eds.), **Handbook of Qualitative Research**, Sage Publications, London, 1994, pp. 123-126.
- [11] B.M. Mattew, A.M. Huberman, **Analisis Data Kualitatif Buku Sumber Tentang Metode-Metode Baru**, Terjemahan Tjetjep Rohendi Rohisi, Jakarta Universitas Indonesia, 2007, pp. 201-228.
- [12] A.E. Racelis, *In the Western Solomon Islands*, **Kabutaulaka**, **6**, 2011, pp. 26–38.
- [13] D. Celentano, G. Xavier Rousseau, V. Lex Engel, C. Lima Façanha, E. Moreira de Oliveira, E. Gomez de Moura, *Perceptions of environmental change and use of traditional knowledge to plan riparian forest restoration with relocated communities in Alcântara, Eastern Amazon*, **Journal of Ethnobiology and Ethnomedicine**, **10**, 2014, Article Number: 11.
- [14] A.P. Utomo, M.H.I. Al Muhdhar, I. Syamsuri, S.E. Indriwati, *Local ecological knowledge in angklung paglak of using community of Banyuwangi, Indonesia*, **Applied Ecology and Environmental Research**, **16**(3), 2018, pp. 3215-3228.
- [15] R.R. Nóbrega Alves, A. Feijó, R.R. Duarte Barboza, W. Medeiros Silva Souto, H. Fernandes-Ferreira, P. Cordeiro-Estrela, A. Langguth, *Game mammals of the Caatinga biome*, **Ethnobiology and Conservation** **5**, 2016, pp. 5-51, doi:10.15451/ec2016-7-5.5-1-51.
- [16] I.C.A. Sandu, P. Spiridon, I. Sandu, *Current Studies and Approaches in the Field of Cultural Heritage Conservation Science. Harmonizing the Terminology in an Interdisciplinary Context*, **International Journal of Conservation Science**, **8**(1), 2017, pp. 81-88.
- [17] J. Falconer, J.E.M. Arnold, **Household food security and forestry: an analysis of socioeconomic issues**, Community Forestry Note 1, Rome, FAO, 1989.
- [18] A.R. Lebbie, R.P. Guries, *Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone*, **Economic Botany**, **49**(3), 1995, pp. 287–308.

- [19] E.K. Kakudidi, *Cultural and Social Uses of Plants from and around Kibale National Park , Western Uganda*, **African Journal of Ecology**, **42**(1), 2004, pp. 114–118.
- [20] E. Rashkow, *Resistance to Hunting in Pre-independence India: Religious environmentalism, ecological nationalism or cultural conservation?*, **Modern Asian Studies**, **49**(2), 2015, pp. 270-301, DOI: <https://doi.org/10.1017/S0026749X14000110>.
- 

*Received: August 20, 2018*

*Accepted: August 25, 2019*